



UNIVERSITY *of* NICOSIA

Working flexibly: A study on German SMEs in relation to
information and communication technology and leadership

Henning Tirrel

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Abstract

The purpose of this exploratory sequential mixed methods study on German SMEs is to deepen understanding on the nature of relationships between workplace flexibility practices (WFPs) and SME performance indicators, with particular emphasis on information and communication technology (ICT), leadership and trust on an organizational level. To achieve that, this study aims at identifying and investigating the impact of the variables that affect SME performance indicators if employees work in flexible workplaces. Methodologically, first, a systematic literature review, enhanced by a narrative one, identifies variables related to working flexibly, especially downsides, and result in an initial framework conceptualizing the influence of WFPs, transformational leadership, HR commitment practices and trust on SME performance indicators. Second, a qualitative study is conducted in which leaders of flexibly working SME employees are interviewed in order to fill knowledge gaps reflected by the developed conceptual framework, to be later validated by further quantitative analysis. Third, and based on the insights of the literature review and the interviews, a new scale for measuring technological requirements of virtual leadership (TRVL) is developed following a multi-method procedure ending with a confirmatory factor analysis ($CR = .886$, $AVE = .795$, $GFI = .938$, $CFI = .964$, $RMSEA = .084$). Fourth, a quantitative study focusing on company/team leaders in German SMEs analyzes the nature of the associations between WFPs, leadership, TRVL, trust, HR commitment practices and SME performance indicators via partial least squares structural equation modeling.

The main results of this study highlight that technology, in particular, has the power to either support or hinder leadership when employees work flexibly. In this context, transformational leadership is a suitable leadership style for leading flexibly working employees due to its trust enhancing properties (shown by both, the qualitative and quantitative studies). Hence, trust is understood as the very foundation for flexible work. The nexus between transformational leadership climate and internal numerical flexibility, i.e., temporal and local flexibility, is positively and fully mediated by TRVL. Furthermore, there is no evidence that working flexibly has either a positive or a negative impact on firm-level employee performance. However, it rather serves as a benefit for making work more attractive. From a managerial perspective, companies should therefore implement flexible work for better recruiting and retaining employees, but not enhancing performance indicators. Moreover, as technology is highly important, organizations must technologically equip leaders and employees well and train them to use it appropriately. This is necessary because TRVL explains the relationship between transformational leadership climate and working flexibly.

This study contributes knowledge to WFPs by (1) analyzing and summarizing the current status of academic literature in this research stream in which downsides in particular were evaluated and structured into four categories for the first time, (2) developing the first multi-level conceptual framework embracing and interrelating all WFPs, transformational leadership climate, HR commitment practices and trust with SME performance indicators, (3) analyzing the impact of certain interrelated constructs (especially WFPs) of the conceptual framework on SME performance indicators, (4) setting up an avenue for further research as well as (5) developing a validated scale on technological requirements of virtual leadership. This scale contains two factors (competent usage of virtual media in communication with employees and (organizational) support to ensure the ability to work flexibly) with four items respectively. Finally, (6) a new nature of relationship has been explored as the nexus between transformational leadership climate and internal numerical flexibility is fully mediated by technological requirements of virtual leadership, representing a new contribution to knowledge.

Keywords: Workplace flexibility practices, leadership, technology, internal numerical flexibility, SME performance indicators, technological requirements of virtual leadership, systematic literature review, qualitative case study, scale development, structural equation modeling, mixed methods, small and medium-sized enterprises

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Declaration

I declare that the work in this thesis was carried out in accordance with the regulations of the University of Nicosia. This thesis has been composed solely by myself except where stated otherwise by reference or acknowledgment. It has not been previously submitted, in whole or in part, to this or any other institution for a degree, diploma or other qualifications.

Signed

Date

Tirrel, Henning



Publications and presentations relating to this PhD thesis

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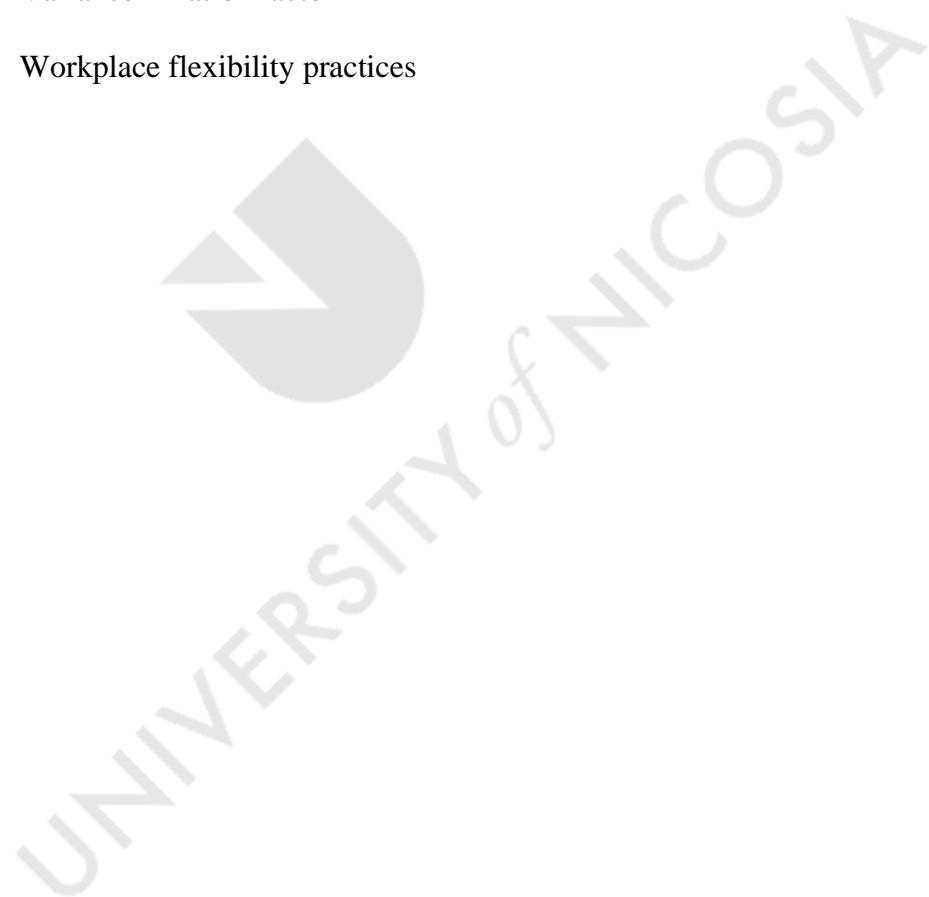


Abbreviation Index

| | |
|--------|--|
| AGFI | Adjusted goodness-of-fit index |
| AMOS | Analysis of moment structures |
| AVE | Average variance extracted |
| BCa | Bias-corrected and accelerated |
| CB | Covariance-based |
| CF. | Compare for |
| CFA | Confirmatory factor analysis |
| CFI | Comparative fit index |
| CI | Confidence interval |
| CR | Construct reliability |
| C.R. | Coefficient of reliability |
| DRQ | Detailed research question |
| DF | Degrees of freedom |
| EFA | Exploratory factor analysis |
| GDPR | General data protection regulation |
| GFI | Goodness-of-fit index |
| HOC | Higher-order construct |
| HR | Human resource |
| HRM | Human resource management |
| H-SLT | Heidelberger Struktur-Lege-Technik |
| HTMT | Heterotrait-monotrait ratio |
| I1-I12 | Interviewee 1 until interviewee 12 |
| ICT | Information and communication technology |
| IFI | Incremental fit indices |

| | |
|---------|--|
| IL | Individual level |
| IQ | Interview question |
| IT | Information technology |
| ITCV | Impact threshold of a confounding variable |
| KMO | Kaiser-Meyer-Olkin |
| LM | Linear regression model |
| LOC | Lower-order construct |
| M | Mean |
| MAR | Missing at random |
| MCAR | Missing completely at random |
| Mdn | Median |
| MICE | Multivariate imputation by chained equations |
| MM | Mixed methods |
| MSA | Measure-of-sample-adequacy |
| N | Sample size |
| N. A. | Not available |
| NFI | Normed fit index |
| n. r. | no ranking |
| n. sig. | not significant |
| OL | Organizational level |
| PLS | Partial least squares |
| PLS-SEM | Partial least squares structural equation modeling |
| RMSE | Root mean square error |
| RMSEA | Root mean square error of approximation |
| RO | Research objective |

| | |
|------|--|
| RQ | Research question |
| SEM | Structural equation modeling |
| SHRM | Strategic human resource management |
| SME | Small and medium-sized enterprises |
| SMS | Short message service |
| TL | Team level |
| TLI | Tucker Lewis index |
| TRVL | Technological requirements of virtual leadership |
| VIF | Variance inflation factor |
| WFPs | Workplace flexibility practices |



CHAPTER 1 INTRODUCTION

1.0 Introduction

The overall idea of relocating work outside the companies' facilities goes back to the early 1980s (Toffler, 1980a; 1980b). This has been further ignited due to the COVID-19 pandemic that has fundamentally changed the working style of the majority of employees on a global scale. Currently, human resource management (HRM) departments of companies are challenged by this development since employee motivation and performance are affected by working flexibly (Taskin and Edwards, 2007). Weitzel et al. (2019) identified that 43.3% of German companies offered employees the opportunity to work flexibly already before the COVID-19 pandemic, in response to rising employee demand as well as shifting and uncertain market conditions (Rubery et al., 2016; Smith et al., 2018; Värlander, 2012). The COVID-19 pandemic, however, reinforced this movement, as working from different locations has become more common at this time (Hans-Böckler-Stiftung, 2021). Conclusively, working style perceptions have changed and "work is no longer a place to go to" (Petrulaitiene et al., 2017, p. 153). Today, employees can work at home (first place), at the workplace (second place) or in all other places (third places; for further explanations see chapter 1.2.3) (Oldenburg, Ray, 2001; 1999; Oldenburg, Ramon and Brissett, 1982). The condition, in which companies allow their employees to autonomously decide on where and when to work, is called internal numerical flexibility and falls under the umbrella term of various workplace flexibility practices (WFPs) (Whyman and Petrescu, 2015). These represent different options of expressing flexibility, for example, through temporal and local flexibility (internal numerical flexibility), adjusting the size of the workforce (external numerical flexibility), internal restructuring due to changing requirements for reaching the desired output (functional flexibility), making decision-making processes more flexible (procedural flexibility) and the possibility of using different remuneration systems (cost flexibility). Specifically, internal numerical flexibility is of heightened interest for a variety of German companies/industries as it is desired by 67.4 percent of employees whereas only 43.4 percent of companies offer them this possibility (Weitzel et al., 2019). Thus, according to Ryan and Wessel (2015), geographically dispersed workforces arise. Further explanations on WFPs follow in chapter 1.2.2.

There are many advantages of working flexibly as it is helping companies to attract the best candidates and retain them in the war for talent (Beham et al., 2015; Iscan and Naktiyok, 2005; Illegems and Verbeke, 2004; Illegems et al., 2001; Kossek et al., 2006). Moreover, working flexibly is an opportunity-enhancing HR practice, which enables employees "to use their skills and motivation to achieve organizational objectives" correlating with increased

motivation as well as operational outcomes (Jiang et al., 2012, p. 1267). Conversely, there are also downsides to working flexibly, such as feeling a need to always be reachable (Kingma, 2016; Lal and Dwivedi, 2009; Tietze, 2002) or role conflicts due to blurring boundaries with employees' private lives (Hartig et al., 2007; Kingma, 2016; Kossek et al., 2006; Lautsch et al., 2009; Sullivan and Lewis, 2001). These are some of the reasons why companies do not implement flexible work.

Working flexibly has been crucially supported through further advancing information and communication technology (ICT), enabling employees to seamlessly work all around the globe (Bean and Hamilton, 2006; Coenen and Kok, 2014; Kingma, 2016), despite the fact that the use of ICT is not mandatory for flexible work. In 2017, 70 percent of EU enterprises with a minimum of respectively ten employees (compared to 66 percent in 2014) provided their employees with mobile devices, which were connectable to the internet (Eurostat, 2021b; 2016). In Germany, however, a contradictory development is apparent: In 2014, 71 percent of employers handed out mobile devices to their employees, while in 2017 only 66 percent of the employers did so (Eurostat, 2021b; 2016). This has probably already changed during the COVID-19 pandemic in order to keep employees working, regardless of where they are located and when they (want to) work. In any case, it is paramount that "organizations need to fully utilize the advancement and development of information technology" (Chen, L. et al., 2021, p. 470). In turn, this presupposes the necessary hardware and software to be available in the company and that leaders and employees being work with it, provided they are trained in the usage of technology (Cowan, 2014; Darics, 2020; Hou, 2020; Sharpp et al., 2019). This implies that leadership is affected by ICT, and, hence, researchers call for its integration into leadership theory (Van Wart et al., 2017; Yukl, 2015). The role of leadership indeed seems important in flexible workplaces as trust can be enhanced via certain leadership styles (e.g., transformational leadership) (Braun et al., 2013; Jena et al., 2018; Podsakoff et al., 1990; Yukl, 1989). In the context of employees working flexible, the role of trust is ever more important as distrust leads to counterproductive behavior when employees do not trust their co-workers (Nordbäck et al., 2017). Latter strongly implies to put trust centerstage when investigating the performance of companies due to the potential detrimental implications of a lack of trust.

Furthermore, a research gap has been identified since theoretical knowledge is lacking on how all WFPs (not only a fraction) interrelate and how they are associated with performance indicators, with SMEs (small and medium-sized enterprises) being a particularly under-researched area performance (Biron and van Veldhoven, 2016; Kingma, 2016; Kotey, 2017;

Martínez-Sánchez, Pérez-Pérez et al., 2008; Maruyama and Tietze, 2012; Masuda et al., 2017; Mesu et al., 2013; Whyman et al., 2015). As already indicated, the role of ICT in relation to working flexibly and leadership has not been sufficiently examined so far, in particular due to the further technological development in recent years (Golden and Veiga, 2008; Nordbäck et al., 2017; Martínez-Sánchez et al., 2007). The research gap will be presented in more detail in chapter 2.2.5.

1.1 Research questions, aim, research objectives – structure of this PhD thesis

Within this PhD thesis, WFPs, especially flexibility referring to workplace and work time, will be analyzed. The aforementioned statements as well as the situation companies are facing due to the COVID-19 pandemic highlight the need for further knowledge on how WFPs interrelate and are related to antecedent factors along with influencing performance indicators (detailed description of the gap follows in chapter 2.2.5). A focus will be set on SMEs in Germany since HRM research on them is “historically underdeveloped” although they represent 99.4 % of companies in Germany (Statistisches Bundesamt, 2022d; Statistisches Bundesamt, 2022b).

The previously mentioned statements and viewpoints lead to the following research questions (RQ):

RQ1a: Which employee-related variables, of those working in flexible workplaces, affect company performance?

RQ1b: Which variables, related to the socio-technological environment, affect company performance?

RQ2: Which are the inhibiting factors of success of flexible workplaces?

RQ3: To what degree do workplace flexibility practices increase or decrease company performance?

With respect to these three above-mentioned research questions, the following aim is pursued.

Aim: To identify and investigate the effect of the variables that affect company performance if employees work in flexible workplaces.

To answer the research questions and reach the aim, four research objectives (RO) are set up:

- RO1: To examine relevant literature in the field of flexible workplaces for setting up a conceptual framework as a foundation for this research.
- RO2: To identify influencing factors of flexible workplaces on company performance with respect to employers, employees and the socio-technological environment.
- RO3: To develop a causal model as a new contribution to knowledge explaining the nature of the factors' relationship, such as moderating/mediating effects and the intensity and direction of the variables related to the performance of employees working in flexible workplaces.
- RO4: To develop a new scale containing technological aspects of leading flexibly working employees as a new contribution to knowledge.

In order to pursue the ROs and the aim as well as to answer the RQs, both primary and secondary (literature review) research will be conducted. This thesis will – after introducing the topic, research questions, aim and objectives – continue with definitions on working flexibly, so a basic understanding is established.

In the second chapter, the literature review will be conducted, which contains two parts; a systematic literature review that will be supplemented by a narrative one in order to overcome the downsides of both reviews and benefit from their advantages. These will identify theoretical gaps and refer to RO1 and RO2 and contribute to RQ1a, RQ1b and RQ2. At the end of the second chapter, theoretical gaps will be presented, the need for theory development will be discussed and a new initial conceptual framework will be developed, derived from the literature. This initial conceptual framework presents a new contribution to knowledge and already fills a theoretical gap since no all-encompassing conceptual framework exists, which includes all WFPs. Thus, relationships between these practices as well as relationships between the WFPs and other constructs, like company performance, are – derived from the literature and based on theories – established and visualized. Therefore, the research stream on WFPs is more structured now.

The research philosophy (in this case, critical realist/critical realism) will be discussed in the third chapter. Moreover, the research purpose and the general research design will be presented. This sets the foundation for the next steps of this PhD thesis since the chosen research philosophy is appropriate for the proposed mixed methods research.

In the fourth chapter, a qualitative case study will be conducted, which concentrates on the anticipated relationships between working flexibly, leadership, technology and trust as there

is not sufficient knowledge on how these factors interrelate. Therefore, semi-structured expert interviews will be conducted and analyzed according to the Gioia methodology (Gioia et al., 2013). The results lead to a revised conceptual framework which will set the foundation for quantitative research. Moreover, the interviewees uncover a need for including technology in the nexus between transformational leadership and working flexibly. However, such a scale does not exist so far. The qualitative case study evaluates RO2 and RO3 and represents the starting point for informing about RO4 by again contributing to RQ1a, RQ1b and RQ2.

The quantitative studies will be discussed in the fifth chapter. Firstly, a new scale on technological requirements of virtual leadership will be developed by following a multi-method procedure (RO4), as uncovered through the interviews. Secondly, the scale will be implemented in the revised conceptual framework to be part of the following quantitative survey. Therefore, the expected relationships within the model (the former conceptual framework) will be analyzed statistically by using partial least squares structural equation modeling (PLS-SEM), which represents a validation of the model as well as the new scale. So, SEM will be applied for statistically analyzing the developed causal model (RO3), which also includes the new scale (RO4). Thus, RQ3 will be answered afterwards.

The sixth chapter will provide concluding discussions in which qualitative and quantitative results as well as results from the literature reviews will be cross-validated and synthesized. Therefore, the results will be discussed, limitations of research as well as implications for further research will be presented and finally theoretical as well as managerial implications will be given.

Each chapter will end with a conclusion, so empirical or theoretical interim results will be presented and discussed briefly. Figure 1.1 visualizes the structure of the thesis, while table 1.1 presents the links between research question(s), research objective(s), research method(s), research technique(s), detailed research question(s) and hypotheses.

Figure 1.1: Structure of the PhD thesis

Own depiction

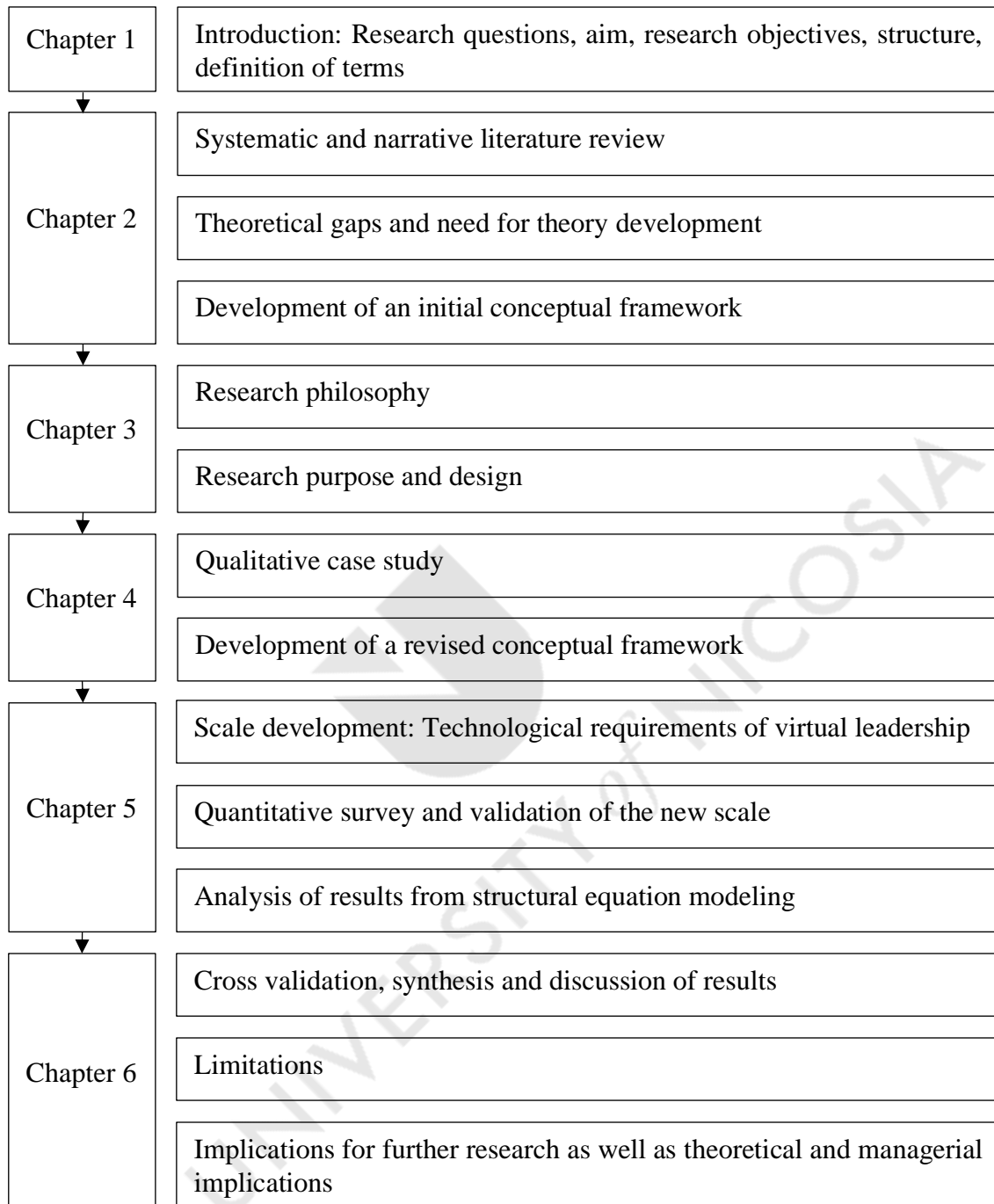


Table 1.1: The grand design

Own table

| Research question(s) | Research objective(s) | Research method(s) | Research technique(s) | Detailed research question(s) | Hypotheses |
|----------------------|-----------------------|--------------------|---|-------------------------------|--------------------------------------|
| RQ1a & RQ1b | RO1, RO2, RO3 | Case study | Systematic literature review & mono method (qualitative interviews) | DRQ1, DRQ2, DRQ3 | None |
| RQ2 | RO2, RO3, RO4 | Case study | Systematic literature review & mono method (qualitative interviews) | DRQ1, DRQ2, DRQ3 | None |
| RQ3 | RO3, RO4 | Survey | Mono method (quantitative questionnaire) | None | H ₁ until H ₂₃ |

1.2 Definition of terms and status quo of SMEs in Germany

In the following paragraphs, the relevant terms regarding this research will be defined. First, HRM will be defined. Afterwards, the aspect of flexibility, especially in the context of work, will be defined. This chapter closes with a focus on WFPs (flexible workplace and time) as well as the differentiation between telework and telecommuting.

1.2.1 Human resource management

Since workplace flexibility concerns employees, this is an issue of human resource management. All management activities of a company associated with people, work and managing employment are understood as HRM (Boxall and Purcell, 2016; 2000). According to Becker and Huselid (1998, p. 55), “an internally consistent and coherent HRM system that is focused on solving operational problems and implementing the firm's competitive strategy is the basis for the acquisition, motivation, and development of the underlying intellectual assets that can be a source of sustained competitive advantage”. Moreover, referring to Bratton and Gold (2017), there are four core responsibilities that the HRM needs to handle, explained in the following: Firstly, the quantity of employees, qualified for the job, need to be available. Secondly, the employees must have the right knowledge and skills for an effective and efficient performance. Thirdly, the values and the culture of an organization should align with

those of the employees. And fourthly, the needs of organizations as well as employees should be overlapping. By having a closer look at the term, it is obvious that human resources (HR) are going to be managed, so there is action required (Boxall and Purcell, 2016). Skills or knowledge which can be used for a variety of tasks at work and elsewhere, e.g., building relationships, are human resources (Boxall, 2013). Therefore, human resources are more than just the people themselves (Boxall and Purcell, 2016). Assets (strengths) and liabilities (weaknesses) influence the lives of people (Boxall and Purcell, 2016). Independent people occupy sets of strengths (assets) and weaknesses (liabilities) as human resources (Boxall, 2013; Boxall and Purcell, 2016). Going into more detail, the viability and created value of organizations result from human resources (Boxall, 2013). In many companies, HR specialists take care of adhering to and implementing the workforce strategies (Boxall and Purcell, 2016; Huselid, 2018; Huselid et al., 2005). If this is not the case, line managers are responsible for these tasks (Boxall and Purcell, 2016). Combined with a specific strategy (e.g., influenced by country, sector, labor market, responses of employees), there is “a concern with the ways in which HRM is critical to organizational effectiveness” (Boxall and Purcell, 2000, p. 184). Thus, strategic relevant choices are made by a strategic HRM (SHRM) (Boxall, 2003; Boxall and Purcell, 2000).

1.2.2 Introduction to workplace flexibility practices

Referring to Muduli (2013, p. 59) “flexibility is [generally] considered as the ability to pursue different business strategies and tactics, to quickly change from one strategy/task/job to another”. Therefore, an institution is flexible if it is able to reach different goals and to produce different products (Zhang and Sharifi, 2000; Sharifi and Zhang, 1999), due to different strategies. Moreover, flexibility contains items with respect to the product, the organization and the people flexibility (Zhang and Sharifi, 2000; Sharifi and Zhang, 1999).

Referring to Hill et al. (2008, p. 152) workplace flexibility is defined as “the ability of workers to make choices influencing when, where and for how long they engage in work-related tasks”. Kelly and Moen (2007) support this view in the sense that employees have the ability to control where and when they work. Whyman et al. (2015) classify three different types of workplace flexibility practices (WFPs): numerical, functional and cost flexibility.

Temporal (or numerical) flexibility represents an adjustment of the company’s internal work organization concerning changes (Martínez-Sánchez et al., 2011; Martínez-Sánchez, Vela-Jiménez et al., 2008). It harmonizes either the working time of workers or the number of workers (e.g., via job sharing, flexitime, shift working or part-time working) as well as the workplaces (Whyman and Petrescu, 2015). The harmonization of job content refers to

functional flexibility, characterized by Grenier et al. (1997) by stating that multiskilling and work organization are part of functional flexibility. Therefore, job autonomy as well as training are examples of how improved performance can be achieved (Whyman et al., 2015). The wage (or cost) flexibility deals with the determined remuneration (e.g., performance-related or merit pay) (Whyman et al., 2015). Moreover, Stewart and Spatz (1993) discuss procedural flexibility and state that employees are trained to make their own decisions, so that not only management decides. This leads to higher productivity, commitment and changes (Stewart and Spatz, 1993). So, this aspect of flexibility focuses on the limitations of managerial decision-making procedures (Colvin, 2006). A higher flexibility, an improved creation of jobs as well as an increased productivity can be realized (Addison and Teixeira, 2003; Buchele and Christiansen, 1998) while companies may not be bound to employees for a long period of time (Drago, 1996).

Dimitrova (2003) generally states that the employee's flexibility regarding space and time increases autonomy and commitment. According to Whyman et al. (2015), WFPs have an impact on company performance as well as on motivation and human capital (Appelbaum et al., 2001; Huselid, 1995; Jiang et al., 2012). Therefore, WFPs are of strategic relevance (Whyman et al., 2015) as an HRM system is strongly related to the firm's financial performance (Becker and Huselid, 1998).

So, these flexibility practices typically relate to the workforce, which again highlights the association of this topic with HRM. Hall et al. (2017) state that people employed by a company define a workforce. This common understanding of a workforce has been manifested in the past (Bockman and Sirotnik, 2008; Holtzhausen and Fourie, 2008; Huselid, 2018; Jacobson, 2011; Judit et al., 2017; Kalleberg, 2000; Karl and Sutton, 1998; Lincoln, J. R. and Kalleberg, 1985; Worthley et al., 2009). Moreover, a flexible workforce has the power to make a competitive advantage in an environment of global business (Katayama and Bennett, 1999; Muduli, 2013). The different WFPs will be further discussed in chapter 2.3.3.1.2.

1.2.3 Flexible workplaces

Because this work focuses on workplace flexibilities, the concept of third workspaces is introduced now. Third workspaces belong to the trend of flexibilization and differentiation of workspaces (Kingma, 2016). Besides the first place (home) and the second place (work), there are third places (Oldenburg, 2001; 1999; Oldenburg and Brissett, 1982). According to Oldenburg and Brissett (1982), third places are emergent and elusive due to changing lifestyles while certain characteristics define them. Sociability – or building relationships due to interactions, which would not have been built without the third place – is a major aspect

of third places (Oldenburg and Brissett, 1982; Purnell, 2015). Furthermore, there is no social status demanded for participating in third places (Humphreys, 2007; Oldenburg, 2001; Oldenburg and Brissett, 1982; Purnell, 2015). In addition, third places should provide comfort and be welcoming (Mehta and Bosson, 2010; Oldenburg, 2001; Purnell, 2015). Finally, to make participation enjoyable, regulars should be available (Jeffres et al., 2009; Purnell, 2015). There are several examples for third places, such as coffeehouses, bars (Oldenburg, 1999), restaurants (Oldenburg, 1999; Rosenbaum, 2006), farmers markets (Bright, 2013; Tiemann, 2008), festivals (Hawkins and Ryan, 2013), libraries (Audunson, 2005; Harris, C., 2007) as well as virtual environments (Ducheneaut et al., 2007; Williams, 2006). Furthermore, Soja's work about Thirdspaces (1996) as well as Lefebvre's work on *The Production of Space* (1991) complete the definition of third workspaces. Soja's (1996) understanding of thirdspaces is a more abstract one, in which spatial, historical and social dimensions interact and where an open place is created. "It is a space where issues of race, class, and gender can be addressed simultaneously without privileging one over another" (Soja, 1996, p. 5). Therefore, a thirdspace is a flexible and tentative term in which meanings, ideas, appearances and events are changing (Soja, 1996). Lefebvre (1991) states that space needs to be produced and that there is a spatial practice (interactions of individuals in a society), a representation of space (geographically planned space, for instance by urbanists or planners) as well as the representational space (described by philosophers and writers with symbols and images). Kingma (2016) points out that third workspaces are solutions to market problems that have been specifically designed for this purpose and also contain user experience. Moreover, resources and tools are used in the spatial practice (Taylor and Spicer, 2007). To sum this up, the third workspace is a new space to work besides the company office and the private home (Kingma, 2016).

So, there is a linkage between internal numerical flexibility (cf. Whyman et al. (2015) as well as Whyman and Petrescu (2015)) and third workspaces by Kingma (2016) because internal numerical flexibility refers also to a variety of workplaces (Whyman and Petrescu, 2015).

Within the concept of telework (which also includes temporal and spatial freedom (Towers et al., 2006)), employees are "supported by technological connections" (Fitzer, 1997, p. 65) which means that employees need to work with a computer in remote locations (Caillier, 2012). This is possible today as globalization enables people to network (Smith et al., 2018). The term telecommuting refers to employees who regularly work from home and use telecommunication technology (Kossek et al., 2006; Nilles, 1998). Moreover, information and

communication technology (ICT) might be used for replacing an office (Bélanger et al., 2013). Nevertheless, for some jobs, it is mandatory to be physically on-site (e.g., assembly line workers, restaurant server), but in some other jobs, this is not the case, especially if the work is knowledge-based (Baruch, 2000; Neftzger and Walker, 2010).

However, it is not necessarily the case that ICT is used all the time or that people mainly work from home for all jobs. Therefore, this study uses a wider approach following the three workspaces as defined before in which the application of ICT is possible but not mandatory.

1.2.4 Small and medium-sized enterprises in Germany

According to the European Commission (2003), SMEs are defined via three elements: staff headcount, turnover and balance sheet total. Table 1.2 provides an overview of what constitutes an SME (which can be divided for statistical reasons into micro, small and medium) (European Commission, 2003).

Table 1.2: The ceilings of the definition

Own table, based on European Commission (2015, p. 11)

| Enterprise category | Staff headcount (FTE) | Financial ceilings | | |
|---------------------|-----------------------|--------------------|----|---------------------|
| | | Turnover | Or | Balance sheet total |
| Medium | < 250 | ≤ € 50 million | Or | ≤ € 43 million |
| Small | < 50 | ≤ € 10 million | Or | ≤ € 10 million |
| Micro | < 10 | ≤ € 2 million | Or | ≤ € 2 million |

99.8% of the companies within the European Union are classified as SMEs (Eurostat, 2021a). Among the companies within the OECD (Organization for Economic Cooperation and Development), 99% are SMEs which generate 50 to 60% of the value added (OECD, 2019).

The German Federal Statistical Office (Statistisches Bundesamt) classifies companies in the same way as the European Commission, but does not use balance sheet total as a key figure (Statistisches Bundesamt, 2022c). 99.4% of the German companies are SMEs, representing 2,576,074 companies in total (Statistisches Bundesamt, 2022d; 2022b). The following table 1.3 summarizes the current situation of SMEs in Germany.

Table 1.3: SMEs in Germany in 2019

Own table, based on Statistisches Bundesamt (2022c; 2022d)

| Enterprise category | Total amount | Total (in per-cent) | Employees | Turnover (in million Euros) |
|----------------------------|---------------------|----------------------------|------------------|------------------------------------|
| Medium | 66,596 | 2.6 | 5,249,140 | 863,323 |
| Small | 385,616 | 14.9 | 6,786,266 | 756,990 |
| Mirco | 2,123,862 | 81.9 | 5,730,320 | 448,135 |
| SMEs in total | 2,576,074 | 99.4 | 17,768,726 | 2,068,448 |

So, SMEs represent the majority of German companies and employ 17,789 million people, accounting for 56 % of German employees (Statistisches Bundesamt, 2022a). Moreover, SME performance in Germany exceeds that of most other member states of the European Union (Söllner, 2014). Summing this up, SMEs are of great relevance for the German economy (Söllner, 2014).

1.3 Conclusions & contribution

The contributions of this PhD thesis to an increase in knowledge are multifaceted. At the beginning, the conclusions/findings will be presented followed by the scholarly (theoretical) and executive (practical) contributions.

There are six conclusions which are briefly summarized as follows: First, existing academic literature focusing on business management will be analyzed and summarized. Second, derived from the body of literature, the first all-encompassing multi-level conceptual framework will be established, integrating all WFPs (including their downsides), along with their antecedent factors and performance indicators, as well as visualizing their interplay. This will also help to clarify the variety of constructs and definitions in this research stream. Third, a qualitative study analyzes the interplay between working flexibly, trust, leadership and ICT, which will further clarify the roles of those elements. Fourth, a quantitative analysis evaluates relationships of organizational level – referring to the conceptual framework – for analyzing the impact of certain constructs on others. Fifth, a new scale on technological requirements for virtual leadership will be developed. Sixth, an agenda for further research will be set up because this research stream is gaining more importance due to the COVID-19 pandemic. Thus, researchers are invited to select specific parts of the agenda to analyze them.

The scholarly (theoretical) contributions are fourfold. First, the WFPs scales have not been developed appropriately leading to scales with several weaknesses. Thus, it is necessary to develop all WFPs scales newly and thoroughly by following scientific standards, enabling them for quantitative analysis without limitations. Second, a new conceptual framework of WFPs, transformational leadership, trust, technology and intra-team communication on SME performance indicators has been developed, constituting a theoretical implication and setting the foundation for future analysis. Third, the flexibility firm theory (Chatterjee, Chaudhuri and Vrontis, 2022; Rodgers, 1992) has been revised as it should not focus on employee performance but on benefits in recruiting and retaining employees. Fourth, a new scale on technological requirements for virtual leadership has been developed. This explains the relationship between transformational leadership climate and working flexibly. Moreover, it follows the calls of other researchers (cf. Van Wart et al. 2017, Yukl, 2015) for the integration of technology in leadership.

Finally, there are four executive (practical) contributions. First, employers need to train their leaders in the transformational leadership style as it is effective in situations in which employees work flexibly, especially when technology is being used. Second, trust needs to be established and maintained between leaders and employees as well as employees and their co-workers. This is a leadership task, i.e., leaders are responsible for implementing trust-building activities and using the transformational leadership style as it enhances trust. Third, technological requirements of virtual leadership are highly important so organizations must equip and train their leaders and employees well in order to avoid misunderstandings during discussions. Fourth, WFPs should be implemented, although they do not enhance company performance. This is necessary as it sends a positive signal to the employment market as well as to the company's workforce, without a reduction in performance. In this way, recruiting and retaining employees can be supported.

CHAPTER 2 LITERATURE REVIEW

2.0 Introduction

When something is being researched, a research question will be answered (Bettany-Saltikov and McSherry, 2016) by applying relevant research methods and techniques. For eliciting findings, a systematic literature review will be conducted. In this way, all relevant information can be identified, selected, evaluated and finally summarized (Brereton et al., 2007). The technique of a systematic literature review is a secondary study which uses primary studies (Brereton et al., 2007).

In this chapter, a systematic literature review will be explained to identify and present the relevant literature and status quo in the field of flexible workforces (compare for research objective one). Furthermore, literature identifies the theoretical gap and therefore justifies the need for this research. Additionally, a narrative literature review (also called traditional literature review) will be conducted to add other relevant sources which could not be identified through the systematic literature review (Easterby-Smith et al., 2015; Thorpe et al., 2005). The systematic literature review only includes peer-reviewed journal papers in order to use high-quality literature. Thus, other publications like books, book chapters or conference proceedings were not included in the systematic literature review, but in the narrative one. Therefore, the purpose of the narrative literature review is to also include publications that are not journal articles, in order to enhance the knowledge generated by the systematic literature review. This leads to a holistic overview of current knowledge in this field. The systematic literature review will be used to avoid the shortcomings of a narrative literature review (providing an overview of literature without a presented methodology that is scientific and focusing on preferences of the researcher in terms of theories or beliefs) (Bettany-Saltikov and McSherry, 2016). Moreover, the systematic literature review summarizes and synthesizes evidence of research in an objective and balanced way (Brereton et al., 2007; Thorpe et al., 2005). Finally, a theoretical gap can be identified and/or a framework can be presented (Kitchenham, 2004).

2.1 Theoretical grounding of the systematic literature review

Several examples exist of how a systematic literature review can be done (compare for Ramírez and García-Peñalvo (2018) as well as Inkinen (2015)). Furthermore, there are guidelines that show how to do it correctly. Kitchenham (2004, p. iv) defines a systematic literature review as “a means of evaluating and interpreting all available research relevant to a particular research question, topic area, or phenomenon of interest”. Referring to Thorpe et al. (2005, p. 258), “the aim is to bring together as many already existing evidence-based studies

as possible that are relevant to the research being undertaken, irrespective of their published location, or even disciplinary background”.

However, there are numerous possible ways to conduct a systematic literature review discussed in the literature. For getting deeper insights into how systematic literature reviews are conducted in highly ranked peer-reviewed journals (as representatives for high-quality research), a narrative literature review focused on literature reviews of human resource management and flexible workforces will be done first to identify the necessary steps. Kingma (2016, p. 191) states that the environment – the third workspace – “seems to moderate the work performances”. According to Jiang et al. (2012) higher performance leads to higher motivation, which in the end leads to higher operational and financial outcomes. Secondly, to get an overview of discussions concerning the relationship of flexible workforces, performance and motivation, a systematic literature review for this study will be defined and finally conducted.

The review process can be divided into several phases and stages. Brereton et al. (2007) defined three phases (plan, conduct and document review) which contain several steps. The first phase summarizes the stages (or activities) of specifying the research questions, then the developing of a review protocol and finally the validation of a review protocol. The second stage concerns how to identify the relevant literature, the selection of primary studies with specific quality criteria (needs to be assessed) as well as the extraction and synthesis of required data. Within the third stage, a report will be written and validated.

A similar review process is presented by Kitchenham (2004). She also uses three phases with several stages/activities. The first phase (planning) concerns why there is a need for review and why a protocol of the review process needs to be developed. The second phase (conducting) identifies the research and selects primary studies. Furthermore, there is an assessment for examining the quality of papers. The data then needs to be extracted, monitored and finally synthesized. The third phase only contains one stage – the reporting of generated data. All these phases and stages are located in an iterative process.

Döring and Bortz (2016) use five phases with different activities. In the first phase (keywords) primary and secondary keywords need to be defined. These keywords can be used in English and the mother tongue of the author when taking national and international research into account. Every keyword used in each language needs to be written down, so a replication of research is possible. Databases need to be defined in the second phase (databases). It is important to consider relevant databases and not just local or accessible ones. Within the

third phase (database query and snowballing technique) a systematic query needs to be done. For doing so, the previously defined keywords will be used. Either a wide or a focused research is possible, relating to the research question. Combinations of keywords and the usage of the Boolean search help to narrow the research. Truncations (putting the asterisk symbol (*) at the end of a word or after an array of letters) can be used to include words with different endings. Referring to Booth et al. (2016) wildcard symbols – using the question mark (?) – can be used to substitute letters and include different spellings (for instance organi?ation would include organization and organisation). According to Döring and Bortz (2016), limitations with respect to the period of time and the source types (for instance only using peer-reviewed journals for getting high quality results) are possible. Through the snowballing technique more relevant literature should be gathered. In the fourth stage (sighting of sources), the results will be evaluated. Therefore, the titles will be read and unimportant sources will be eliminated. Afterwards the same procedure will be done again but the abstracts and after that the full texts (where the acquisition of literature is a prerequisite, fifth stage), instead of titles, are read. In the end, only the useful results remain. If a single result is not available, the project should be continued and that source should be deleted.

Caldwell et al. (2011; 2005) provide a critical appraisal framework for assessing articles. Due to this, the remaining articles have to pass 18 questions. According to Bettany-Saltikov and McSherry (2016) these questions can be answered with yes (two points), partly (one point) or no (zero points), so a maximum of 36 points per article is available and a cut-off point should be defined by the author, so it is clear which articles will (not) be considered as a remaining result. Such a critical assessment of studies values the results, although researchers often trust the implicit quality because journals are peer-reviewed and ranked (Magarey, 2001; Tranfield et al., 2003; White and Schmidt, 2005). In order to identify more relevant literature, Webster and Watson (2002) suggest reading the reference lists of the relevant remaining articles. Inkinen (2015) calls this procedure snowballing.

The findings of the systematic literature review – the summary of evidence – contains two parts; a table with the main characteristics of the studies (description of studies and thematic analysis) and a text that describes the identified studies briefly, which is a part of the documentation process (Magarey, 2001; Tranfield et al., 2003; White and Schmidt, 2005). Tranfield et al. (2003) suggest structuring the table in two major groups: descriptive and thematic analysis. The descriptive analysis should contain information about the author/s, the age of the article and the field, while the thematic analysis should provide information about the approach, the core contributions and probably about key emerging themes as well. To sum

this up, the systematic literature review leads to an accumulated “relatively complete census of relevant literature” (Webster and Watson, 2002, p. xvi).

Radhakrishnan et al. (2017) present another way of conducting a systematic literature review. In this case, keyword co-occurrence networks are used to show links of words and these get counted. These counts are weighted. So, connections and counts of numbers are visible.

There are several advantages and disadvantages concerning systematic literature reviews. According to Thorpe et al. (2005) advantages are that the research will be evidence-based and open to many fields of studies rather than limited to just one. Moreover, the research process is transparent, clear, focused, accessible for researchers working in different areas, several types of publications are covered (Thorpe et al., 2005). It is also less biased because of iterative and inductive methodology and synthesizing the relevant information (Thorpe et al., 2005). Furthermore, the research is replicable (Torraco, 2005). In addition, this technique brings researchers and practitioners together as relevant knowledge is summarized and presented in a structured way (Thorpe et al., 2005; Tranfield et al., 2003). Disadvantages are that publications are often limited to the date of publication (probably not up-to-date), relevant information is missing (narrative literature reviews are needed in addition) and spelling is not consistent, so there are different results (Thorpe et al., 2005). The systematic literature review is limited to databases that allow keyword searches and researchers first rely on just a title and then on an abstract because of the overwhelming amount of results (Thorpe et al., 2005).

2.2 Application of the systematic literature review

Within this systematic literature review keyword co-occurrence networks will not be used because in-depth insights from existing research need to be gained and used for this study and not just the quantity or linkages of specific keywords. Therefore, this systematic literature review is based on the described methodology by Inkinen (2015), Webster and Watson (2002), Brereton et al. (2007) and Kitchenham (2004). Therefore, a review protocol is used for keeping up replicability as well as transparency leading to a rigorous review process as the literature is carefully evaluated which leads to findings that are reliable as they build on existing knowledge (Atewologun et al., 2017; Christofi et al., 2017; Denyer and Tranfield, 2009; Tranfield et al., 2003). So, the systematic literature review is “a specific methodology to locate research, to select and evaluate the contributions made by each study and analyze and synthesize the data” (Lozano-Reina and Sánchez-Marín, 2020, p. 2), ending up with a presentation of results.

No systematic literature review could be identified that addressed the topic under study here (downsides of flexible workplaces and its impact on performance and motivation). This represents a gap which underlines the relevance of this systematic literature review for summarizing the current knowledge, filling the gap (no systematic literature review in this field available) and probably uncovering research gaps for further qualitative and/or quantitative research. Youndt et al. (1996) suggest that further research of strategic human resource management should have a closer look at performance, human resources and strategy, because they expect that a match of HR systems and strategy might lead to higher performance. According to Hill et al. (2008), flexibility may lead to higher motivation, engagement and loyalty of workers. Moreover, the worker gets a (more) positive image of the organization (Yadav et al., 2016). Furthermore, performance should be enhanced due to workplace flexibility (Yadav et al., 2016). Motivated employees affect the corporate performance due to smarter and harder work (Huselid, 1995). So, there is existing knowledge on some aspects of workplace flexibility with its associations to other constructs, but a summary on these aspects either in text form or visualized as a conceptual framework (like a big picture) is missing. A conceptual framework which includes all downsides (including its remedies) of flexible work and all relationships between the constructs would firstly structure the current state of literature – so it is usable in further qualitative or quantitative studies – and secondly it limits endogeneity as it is as all-encompassing as possible.

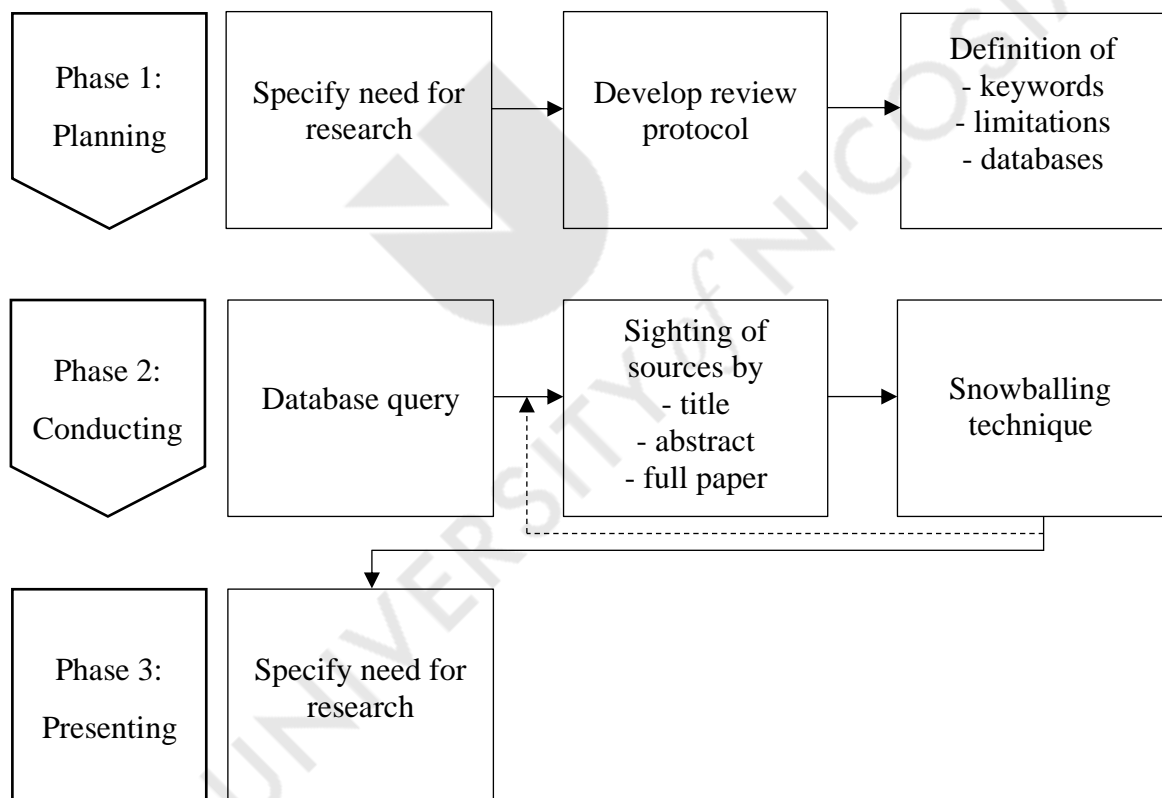
Resulting from the above presented findings about the linkage of performance, motivation and first and third workspaces, a systematic literature review is going to be conducted. So, a better understanding of what a flexible workforce seems to be, can be stated, as postulated by Hill et al. (2008). Furthermore, it might be possible to get further insights in how third workspaces influence work performance (Kingma, 2016). The systematic literature review is not only limited to third workspaces but also contains home offices (first place), because they are located outside the company as well as the third workspaces. Due to the fact that employees often work at home and/or in a company (Biron and van Veldhoven, 2016; Kingma, 2016; Tirrel and Winnen, 2018a) variables relating to performance and motivation are expected to be identified as a result of a broader systematic literature review (not just third workspace) which also contains work from home and therefore work from outside the company premises. Moreover, a wide but also focused systematic literature review will be conducted in which many studies that have already been carried out are brought together, as recommended by Thorpe et al. (2005) and Kitchenham (2004). Furthermore, this systematic literature review did not focus on SMEs due to the fact that larger companies frequently have a professional human resource management (Lepak and Snell, 2002). Lepak and Snell

(2002) also recommend the inclusion of larger companies when SMEs are going to be studied in HRM research for gaining professional insights. In addition, Bacon and Hoque (2005) highlight adopting HRM practices from larger firms in SMEs, so SMEs can learn from larger companies. This leads to a holistic picture which covers SMEs as well as larger companies. The narrative literature review will then focus on SME literature, so the characteristics/specificity of SMEs are included in the literature analysis as well.

The following and aforementioned, at times iterative, process will be applied for this systematic literature review leading to transparency within the research process. Compare for figure 2.1:

Figure 2.1: Systematic literature review process

Own depiction, based on Döring and Bortz (2016), Inkinen (2015) as well as Webster and Watson (2002)



The need for the research is already described in the first chapter of this work. Research question one, two and three may already be answered partially through this systematic literature review. Furthermore, the systematic literature review should, on the one hand, identify the (perceived) theoretical gap as well as the need for further research and, on the other hand, provide an overview of the research field. Due to this, the literature is a germane resource (Hart, 2018). To provide every piece of information that is necessary to replicate this systematic literature review (Döring and Bortz, 2016) as well as to show in advance (before

conducting the systematic literature review) which structure the review will follow under which limitations with minimal biases, a review protocol will be established (Brereton et al., 2007; Kitchenham, 2004). An example for a possible review protocol is provided by Moher et al. (2015) which contains 17 items. In this study the review will be conducted under the following characteristics which are also present in the above-mentioned process and the results are presented in a table and a flow diagram. Therefore, the review protocol (compare for table 2.1) contains the following characteristics which will be applied in the systematic literature review which is depicted in figures 2.1 and 2.2.

Table 2.1: Characteristics of the systematic literature review

Own table

| | |
|-------------------------|--|
| Research questions: | RQ1a, RQ1b, RQ2 |
| Keywords ¹ : | third workspace* OR flex* workplace* OR mobile work* AND performance AND motivation |
| Limitations: | Period of time: Articles that were published between 1980 and 2018 will be selected because the latest information is necessary to identify the theoretical gap and to provide proof of a theory development on the one hand. ² On the other hand, it is relevant not to leave out relevant articles that have not been published in the last few years, but which are relevant for this study. Toffler already stated in 1980 that the work may shift to the homes of the people, so that the rules of life need to be rewritten in times of a technological and informational change (Toffler, 1980; Toffler, 1980). Kingma (2016) developed the concept of third workspaces so that both (work from home and from the third workspace) are included in this systematic literature review. Articles from the early period were also included in the systematic literature review, since flexible work without the use of technology is still possible today - just as it was then (e.g., pre/post-processing of meetings, proofreading of papers, etc.). Thus, the inclusion of these early studies is justified as they retain a certain relevance, even if technological progress means that flexible work today is |

¹ The list of keywords is going to be completed while the systematic literature review is going to be conducted. They will all be noted down for being transparent and to provide replicable information.

² For the description of the theories etc. an additional narrative literature review will be conducted.

significantly different than it was at the beginning of the 1980s. As the systematic literature review ended in 2018, newer sources (as of 2018) will be continuously incorporated via narrative literature reviews as the PhD thesis progresses. Consequently, in the following chapters, reference will also be made to more recent sources in order to incorporate current research findings into this PhD thesis.

Journal: Only peer-reviewed journals will be considered for using high-quality papers which are ranked by the VHB³-JOURQUAL3, Australian Business Deans Council Journal Rankings List (ABDC 2016)⁴ or the Association of Business Schools Academic Journal Quality Guide (ABS 2018)⁵. The ranking of the journals will be considered to choose high-quality papers only. The papers must therefore be ranked in at least one of the three ranking systems.

Study type: Secondary research will be excluded because only the best papers (primary research) will be selected to generate a high-quality outcome.

Language: Because of the researcher's linguistic limitations, only English and German articles will be considered. So, the language bias is reduced as not only English publications are taken into account (Bettany-Saltikov, 2010).

Databases:

Referring to Creswell (2014) databases like EBSCO (and others) are reviewed by researchers. The following databases are going to be used because multidisciplinary sources (e.g., Scopus and Emerald) as well as subject specific databases with respect to business and management (e.g., EBSCOhost (Business Source Premier)) and of science publishers (like Sage) are combined for gaining a variety of high-quality papers (Booth et al., 2016;

³ German Academic Association for Business Research (VHB = Verband der Hochschullehrer für Betriebswirtschaft e.V.), the VHB JOURQUAL3 ranking is: A+, A, B, C, D (Hennig-Thurau et al., 2018)

⁴ Taken from the Journal Quality List, 63rd edition, the ranking is: A*, A, B, C (Harzing, 2018)

⁵ Taken from the Journal Quality List, 63rd edition, the ranking is: 4*, 4, 3, 2, 1 (Harzing, 2018)

| | |
|--------------------------|--|
| | Döring and Bortz, 2016): EBSCOhost, Scopus, Emerald Management 200 and Sage. |
| Approaches: | Articles that either follow an inductive or a deductive approach will be considered as well as articles with an abductive approach. Therefore, there is the opportunity to figure out as much information as possible and the bias of excluding relevant articles will be minimized. |
| Database query: | Keywords (alone and/or together), limitations, Boolean search and truncations will be used. The database queries will be realized from October 05, 2018 until October 09, 2018. |
| Sighting results: | First, by title then elimination of irrelevant results, second, by abstract then elimination of irrelevant results, third, by full text then elimination of irrelevant results. Only studies that meet the research questions and the aim of this study will be chosen, for generating outcome that is integer. |
| Data extraction: | A table will provide detailed, but summarized, information about the remaining results for getting an overview about the current status-quo. |
| Presentation of results: | Within every stage the remaining results will be presented. It is clear and replicable by independent researchers afterwards. The results will be shown in tables, a flow diagram and a running text. |

These characteristics will be used for this systematic literature review. They are founded on the theoretical explanations of how this technique should be used as well as on high quality literature reviews, published in peer-reviewed journals (Booth et al., 2016; Döring and Bortz, 2016; De Stefano et al., 2018; Horwitz, 2015; Poscia et al., 2016; Seeck and Diehl, 2017).

2.2.1 Inclusion and exclusion criteria

Referring to Dada (2018) and also Wang and Chugh (2014), when conducting a systematic literature review, researchers have to decide which studies will be included into the analysis following inclusion criteria, namely boundary strategies, search terms or strings and the pre-defined timeframe. Search boundaries in this review are electronic databases, both multidisciplinary and subject specific (in this case business management) (Booth et al., 2016). Their

use leads to an outcome of high-quality research papers (Booth et al., 2016). Scopus, EBSCOhost, Emerald Management 200 and Sage are the databases that have been used in this study. Keywords were developed, serving as search terms, for covering a broad area in order to receive many relevant results, thereby reducing the chance of missing significant information (Kauppi et al., 2018; Müller-Seitz, 2012). The analysis of relevant literature begun in 1980 as Toffler stated in that year that work is no longer bound to the company's facilities as it can move into the homes of the people, so that the rules of life need to be rewritten in times of a technological and informational change (Toffler, 1980; Toffler, 1980).

Since it is the overall aim of this analysis to achieve high-quality outcomes, all the results which have not been published in ranked peer-reviewed journals were excluded (Vrontis and Christofi, 2021). There is an ongoing discussion on how quality should be assessed in systematic literature reviews. A lot of existing systematic literature reviews (e.g., De Stefano et al., 2018; Horwitz, 2015; Inkinen, 2015; Seeck and Diehl, 2017; Wirtky et al., 2016) did not conduct a quality assessment, in contrast to the recommendations of Caldwell et al. (2011; 2005), but got published in highly ranked journals (for instance in the International Journal of Human Resource Management which is ranked as a B journal by the VHB-JOURQUAL3, compare for implicit quality). Greenland (1994) as well as Jüni et al. (1999) state that quality scores are problematic and can be misleading. From the point of view of the author, the quality assessment is subjective and therefore amenable to influence what reduces the replicability. This leads to the situation that only articles which fulfilled the criterion of implicit quality (based on peer-review processes, as proposed by Tranfield et al. (2003)) were included in the results. The journals had either to be ranked by the Association of Business Schools Academic Journal Quality Guide (ABS 2018), the VHB-JOURQUAL3 or by the Australian Business Deans Council Journal Ranking List (ABDC 2016), so the researcher has not relied on a single ranking system. The consequence is that academic articles only were included but book chapters, for instance, were excluded. As English is the common language in scientific knowledge-based research articles published in academic journals (Kauppi et al., 2018), English publications were taken into account as well as articles published in German as this is the mother language of the researcher. Duplicates have consequently been eliminated.

2.2.2 Search strategy and selecting relevant articles

The systematic literature review, conducted from October 05, 2018 until October 09, 2018⁶, generated the following outcomes based on the keyword search (cf. table 2.2):

Table 2.2: Intermediate results of systematic search

Own table, based on Bettany-Saltikov and McSherry (2016, p. 157)

| Database | Search date | Number of hits re-trieved from the search | Number of articles dis-carded be-cause of ir-relevant ti-tles | Number of articles du-plicated from an-other data-base | Number of articles to be reviewed by abstract |
|------------------------|------------------|---|---|--|---|
| EBSCOhost | October 05, 2018 | 612 | 492 | 0 | 120 |
| Emerald Management 200 | October 07, 2018 | 1,989 | 1,926 | 2 | 61 |
| SAGE jour-nals | October 09, 2018 | 671 | 654 | 0 | 17 |
| Scopus | October 09, 2018 | 101 | 96 | 2 | 3 |
| Sum | | 3,373 | 3,168 | 4 | 201 |

After that, the abstracts of the remaining 201 articles were read. Therefore, it is also relevant to check whether or not the inclusion criteria are met and then to decide if an article should be excluded, included or if the full article has to be read (Bettany-Saltikov and McSherry, 2016). This step is illustrated in the following table 2.3. The complete overview is attached to appendix I.

⁶ Reading the full texts took place after October 09, 2018

Table 2.3: Included articles due to abstracts read

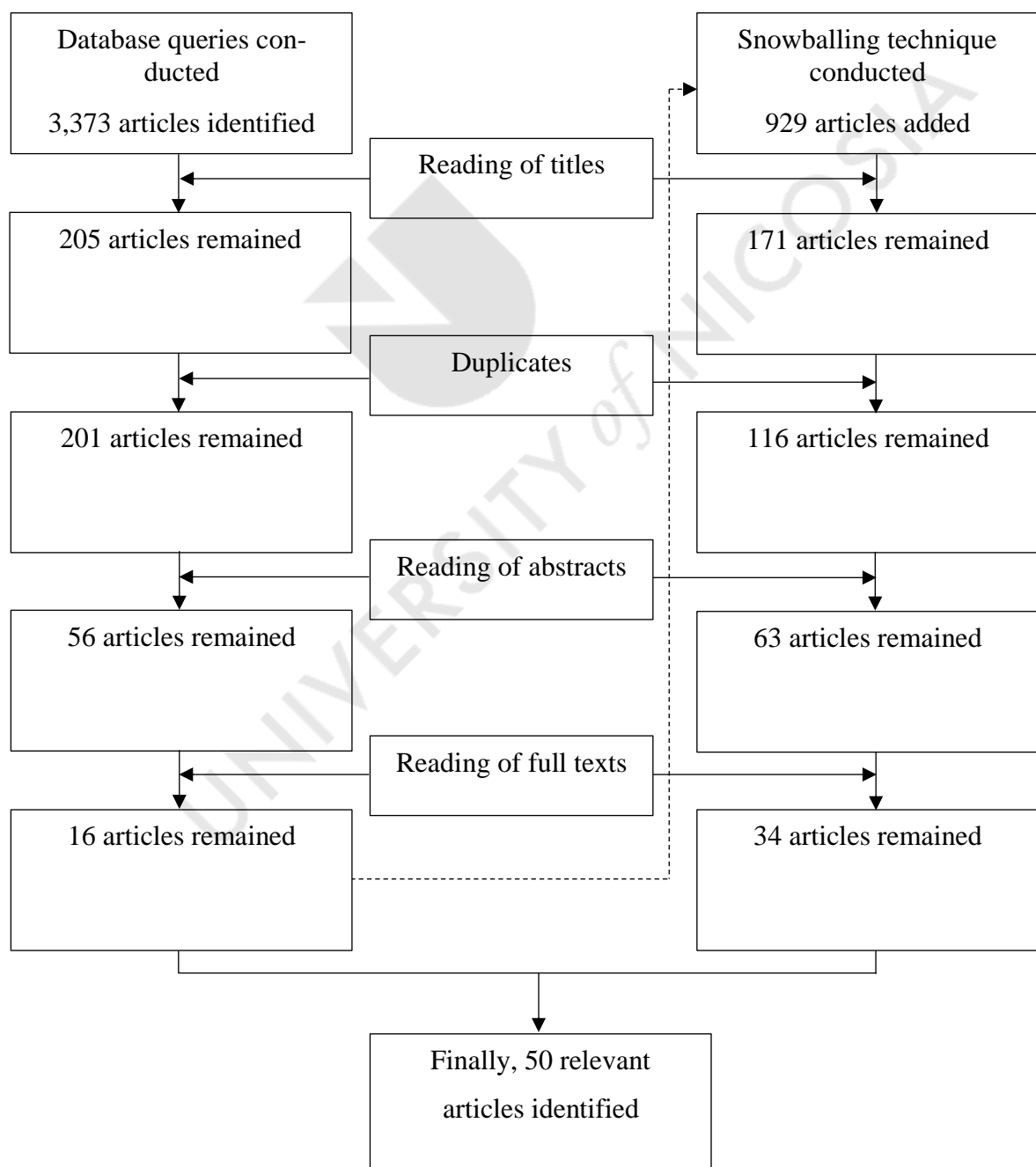
Own table, based on Bettany-Saltikov and McSherry (2016, p. 159)

| Abstract number | 1 | 2 | 3 | 4 |
|---------------------------------|-----------|---------|-----------|-----------|
| Criteria | | | | |
| flexible (third) | | | | |
| workplace or comparable | ✓ | ✗ | ✓ | ✓ |
| Performance | ✗ | ✗ | ✗ | ✓ |
| Motivation | ✗ | ✗ | ✗ | ✗ |
| Other (in-) dependent variables | ✓ | ✗ | ✓ | ✓ |
| Action | full text | exclude | full text | full text |

3,373 possibly relevant articles were identified within the systematic literature review. 3,172 articles were eliminated as they were either irrelevant or duplicates. Therefore, 201 abstracts were read out of which 56 articles remained as they still were relevant. After reading the full texts, 16 relevant articles were identified. Every reference list of these 16 articles was read, so additional 929 article titles were analyzed within the snowballing technique. The same procedure (as already described) was used to analyze these titles for keeping the rigorous approach. 171 of these articles were checked for duplicates (55 were eliminated), 116 abstracts were read and 63 articles were chosen to be read in full length, leading to 34 additional

Figure 2.2: Results of systematic literature review

Own depiction



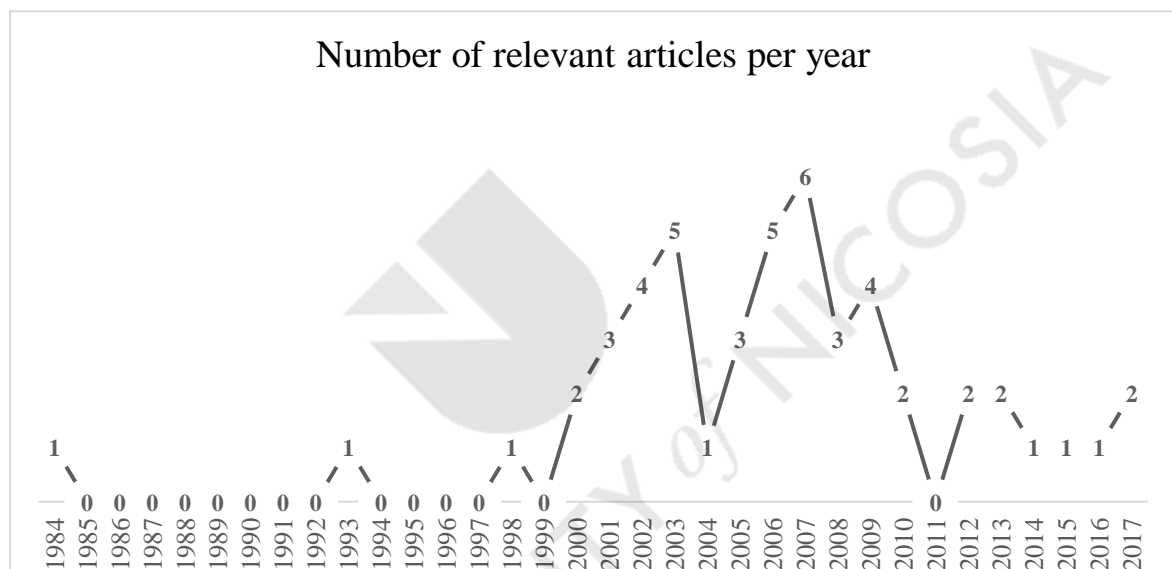
articles which were added to the already gained 16 relevant results. In the end, 50 relevant articles were identified due to the systematic literature review which are to be summarized and presented. Figure 2.2 depicts the before explained procedure.

2.2.3 Descriptive review of the literature

Although Toffler already discussed the movement of work from the companies' premises to people's homes in the eighties, 47 of the identified articles were published later than 1999 (cf. figure 2.3). This reason could be that information and communications technology has evolved massively over the past two decades, making it easier to work from alternative work-places.

Figure 2.3: Number of relevant articles per year

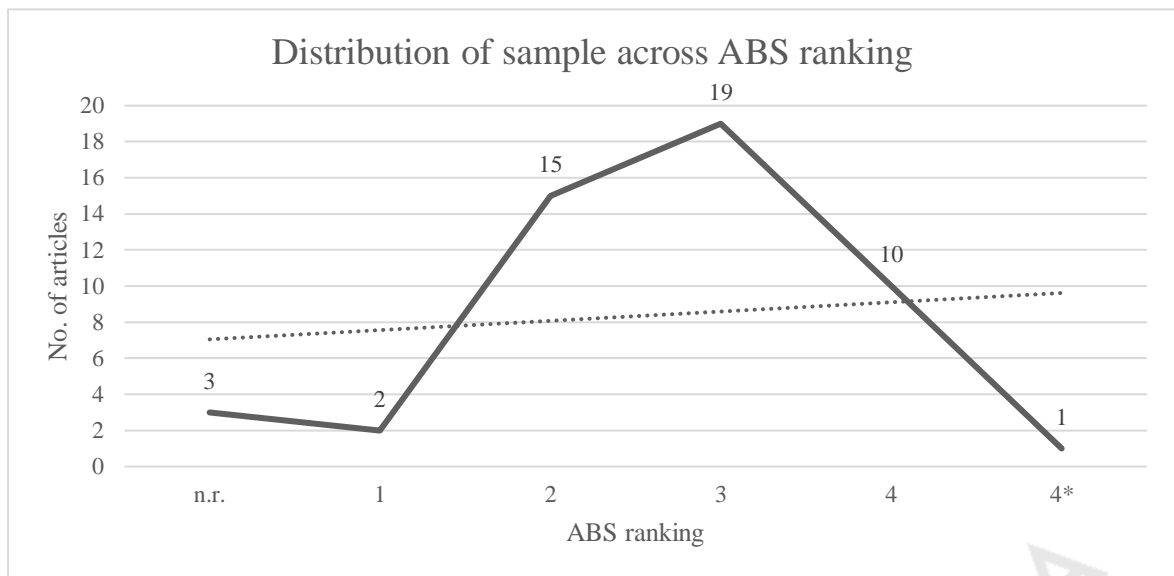
Own depiction



Referring to the implicit quality of the identified articles (cf. Tranfield et al., 2003), this can be considered high, as 60% of the final papers have an ABS ranking greater than or equal to 3, emphasizing the rigor of this study (cf. figure 2.4). For more detailed descriptive information, see the all-encompassing table in appendix II. In this table, all descriptive information is linked to the specific article.

Figure 2.4: Distribution of sample across ABS ranking

Own depiction (n.r. = no ranking)



2.2.4 Presentation and discussion of findings

After the systematic literature review has been completed, a structured description enriched by a flow diagram will be presented. This leads to a high transparency and allows a replication of this research. Moreover, the structure, the steps and the (intermediate) results are visible and interpretable. After every activity has been done, the number of intermediate results (and therefore the number of eliminated results) is presented in figure 2.2.

Finally, the findings of the systematic literature review are going to be presented in a table (cf. appendix II) and discussed in a text form, as suggested by Tranfield et al. (2003) as well as by White and Schmidt (2005). The table contains the following columns, fulfilled with the content of the peer-reviewed journal articles referring to the descriptive analysis: number of study, title, author/s, publication details and year of publication. The following columns concern the thematic analysis: approach, context/population, sample and key results. The results will now be discussed in a narrative text form. Firstly, some requirements for working flexibly will be discussed. Secondly, the positive aspects of flexible work will be presented, and thirdly, the negative aspects will be discussed.

2.2.4.1 Requirements for successful flexible work

In general, tasks need to be suitable for working from different places than the office of the company, so working at a conveyor belt does not work remotely (Hartig et al., 2007; Hislop and Axtell, 2009; Pérez Pérez et al., 2003; Pratt, J. H., 1984). Therefore, tasks are typically

knowledge-based and can be performed at home, in a restaurant, in an airport lobby, in a car etc. (Hartig et al., 2007; Hislop and Axtell, 2009; Pérez Pérez et al., 2003; Pratt, 1984). Therefore, even a combination of different workplaces is realizable (Pérez Pérez et al., 2003). In addition, employees must have the ability to self-organize as no supervisor will be at the same time at the same location for handing over tasks in association with a specific deadline (i.e., time management and job designing skills required) (Baruch, 2000; Beham et al., 2015; Martínez-Sánchez, Pérez-Pérez et al., 2008; Pérez Pérez et al., 2003). Moreover, employees must decide on their own via which (technological) channel they communicate which issue to leaders and colleagues (Baruch, 2000; Beham et al., 2015; Martínez-Sánchez, Pérez-Pérez et al., 2008; Pérez Pérez et al., 2003). Thus, if an employee is unable to work independently and requires close supervision on a daily basis, flexible working may not be appropriate for that person (Baruch, 2000; Beham et al., 2015; Martínez-Sánchez, Pérez-Pérez et al., 2008; Pérez Pérez et al., 2003). According to Baruch (2000), Beham et al. (2015), Dikkers et al. (2007), Lautsch et al. (2009), Masuda et al. (2017) as well as Watad and Will (2003), the (leadership) culture as well as the supervisors need to be supportive in order assure employees that it is acceptable to work flexibly. Therefore, supervisors indicate this, for instance, by saying that they (as well as co-workers) may not require face-to-face communication, but instead require asynchronous communication. In addition, supervisors expect employees to work in a productive manner at home, regardless of whether they have children, fostering a trustful and supportive culture. Whereas in an obstructive culture (shaped by supervisors), a flexible work schedule may be available to employees, but they are led to believe that this is not preferred by their supervisors.

Furthermore, a performance measurement system which is capable of measuring employee's remote performances needs to be established, e.g., management by objectives to ensure that employees have a specific goal in mind which they have to reach (Illegems et al., 2001; Kurland and Cooper, 2002; Lautsch et al., 2009; Masuda et al., 2017; Martínez Sánchez et al., 2007; Mesu et al., 2013; Pratt, 1984; Sardeshmukh et al., 2012; Teo et al., 1998; Watad and Will, 2003). The degree of achieving objectives constitutes individual employee performance, that may for example be controlled via feedback or (online) meetings (Illegems et al., 2001; Kurland and Cooper, 2002; Lautsch et al., 2009; Masuda et al., 2017; Martínez Sánchez et al., 2007; Mesu et al., 2013; Pratt, 1984; Sardeshmukh et al., 2012; Teo et al., 1998; Watad and Will, 2003). Thus, the entire monitoring system focuses on the employee's performance, as achieving higher objectives is associated with higher commitment (Illegems et al., 2001; Masuda et al., 2017). This can be encouraged through performance-related

compensation (Illegems et al., 2001; Masuda et al., 2017; Kurland and Cooper, 2002; Mesu et al., 2013).

2.2.4.2 Positive effects of working flexibly

The degree of flexibility, autonomy and freedom (i.e., deciding where and when to work) of employees increases if they work outside the company premises (Beasley et al., 2001; Collins, 2005; Illegems and Verbeke, 2004; Illegems et al., 2001; Mann et al., 2000; Maruyama and Tietze, 2012; Maruyama et al., 2009; Pérez Pérez et al., 2003; Pratt, 1984; Sardeshmukh et al., 2012; Sullivan and Smithson, 2007; Sullivan and Lewis, 2001; Teo et al., 1998). Furthermore, costs which are borne by the employees (e.g., lower in parking as well as in business clothes) and by the employers (e.g., less office space needed) can be reduced (Beasley et al., 2001; Illegems and Verbeke, 2004; Iscan and Naktiyok, 2005; Mann et al., 2000; Pérez Pérez et al., 2003; Pratt, 1984; Teo et al., 1998; Tomaskovic-Devey and Risman, 1993). Moreover, it is possible to reduce traveling for employees as they do not have to commute to the company every day, resulting in more spare time for them (Baruch, 2000; Beasley et al., 2001; Hartig et al., 2007; Iscan and Naktiyok, 2005; Lautsch et al., 2009; Mann et al., 2000; Maruyama and Tietze, 2012; Maruyama et al., 2009; Pérez Pérez et al., 2003; Pratt, 1984; Sullivan and Smithson, 2007; Teo et al., 1998; Tomaskovic-Devey and Risman, 1993). Due to working flexibly, the employee well-being as well as the work-life balance improve and stress declines as they have more freedom to decide when and where to work, making it easier to combine work and private life (Baruch, 2000; Collins, 2005; Hartig et al., 2007; Iscan and Naktiyok, 2005; Kossek et al., 2006; Mann et al., 2000; Maruyama et al., 2009; Nordbäck et al., 2017; Pérez Pérez et al., 2003; Sullivan and Lewis, 2001; Taskin and Edwards, 2007; Teo et al., 1998). Furthermore, external childcare gets reduced because employees have the chance to work, for instance, while the children are sleeping, assuming they work from home (Beasley et al., 2001; Hartig et al., 2007; Pratt, 1984; Teo et al., 1998). This also leads to better relationships between the employees and their family members (Baruch, 2000; Hartig et al., 2007; Iscan and Naktiyok, 2005; Lautsch et al., 2009; Maruyama et al., 2009; Teo et al., 1998; Tietze, 2002). Moreover, employees are better at taking care of the household as they have the freedom to choose where and when they work (Beasley et al., 2001; Mann et al., 2000; Sullivan and Lewis, 2001). This is why family-to-work as well as work-to-family conflicts decline since employees who merge their private and occupational life have fewer conflicts as the two roles are complementary (Golden et al., 2006; Kossek et al., 2006; Lautsch et al., 2009; Madsen, 2003). Employees are also neither bound to office policies nor are they forced to wear business clothes (Beasley et al., 2001; Mann et al., 2000;

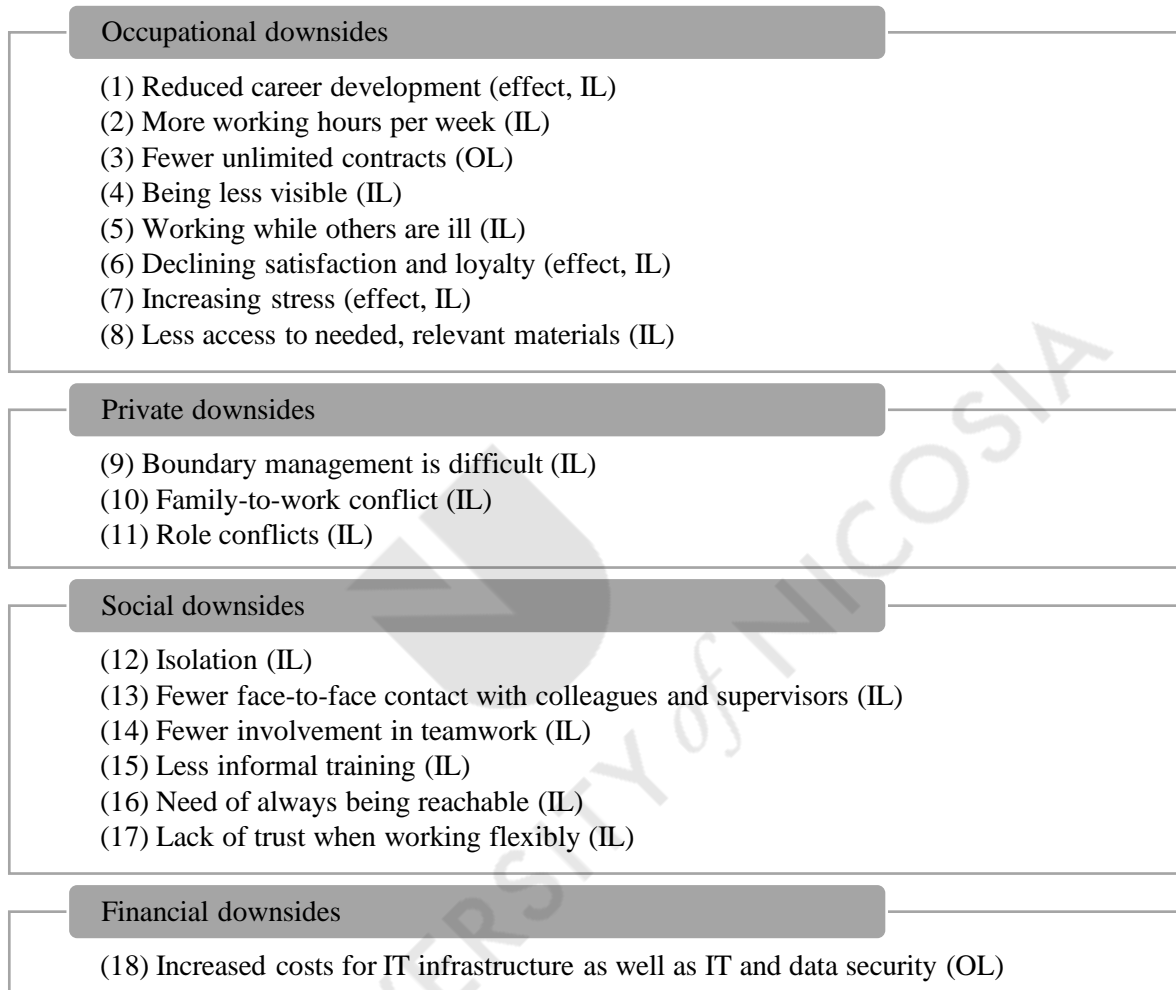
Pratt, 1984). Virtual networks may be set up in order to prevent the employee's isolation (Kingma, 2016; Lal and Dwivedi, 2009; Pratt, 1984; Taskin and Edwards, 2007). The leader-member exchange increases because leaders and employees are aware of the situation that they do not meet regularly, so they compensate it by concentrating on the most important aspects, leading to a vigilant and intensive communication between both parties (Golden, 2006). Distractions from colleagues in the workplace are reduced while absenteeism decreases because employees are prepared to work, even if they feel mildly ill (Baruch, 2000; Beasley et al., 2001; Collins, 2005; Illegems and Verbeke, 2004; Illegems et al., 2001; Iscan and Naktiyok, 2005; Mann et al., 2000; Pratt, 1984). The satisfaction as well as the commitment of employees increase due to working remotely because they have the freedom to structure where and when to work, with fewer distractions, organizational politics and because the leader-member exchange focuses on the most important aspects (Beasley et al., 2001; Collins, 2005; Fonner and Roloff, 2010; Golden and Veiga, 2008; Golden, 2006a; 2006bb; Illegems and Verbeke, 2004; Martínez-Sánchez, Pérez-Pérez et al., 2008; Tomaskovic-Devey and Risman, 1993). Furthermore, remote work is built on trust as leaders and co-workers must have confidence that an employee is actually working (Nordbäck et al., 2017; Taskin and Edwards, 2007). Working remotely is understood as a benefit from the employer and therefore increases productivity and performance of employees because they are able to control their work locations and times on their own, which motivates them (Collins, 2005; Golden and Veiga, 2008; Illegems and Verbeke, 2004; Illegems et al., 2001; Iscan and Naktiyok, 2005; Kossek et al., 2006; Martínez-Sánchez, Pérez-Pérez et al., 2008; Martínez Sánchez et al., 2007; Maruyama and Tietze, 2012; Masuda et al., 2017; Nordbäck et al., 2017; Pérez Pérez et al., 2003; Pratt, 1984; Teo et al., 1998; Tomaskovic-Devey and Risman, 1993). From the point of view of an employer/a company, remote working is beneficial as it is easier to recruit and retain employees as working flexibly is understood as a non-monetary benefit/compensation (Beham et al., 2015; Illegems and Verbeke, 2004; Illegems et al., 2001; Iscan and Naktiyok, 2005; Kossek et al., 2006; Pratt, 1984; Teo et al., 1998; Tomaskovic-Devey and Risman, 1993). Moreover, new target groups of employees can be reached, e.g., retired or disabled employees (Illegems and Verbeke, 2004; Pratt, 1984). In addition, the company supports the environment (f.i. due to less pollution as travelling to the company is reduced) (Iscan and Naktiyok, 2005; Pratt, 1984). All in all, the company's image improves since employees are allowed to work from any location (Illegems and Verbeke, 2004; Illegems et al., 2001; Rau and Hyland, 2002).

2.2.4.3 Negative effects of working flexibly

The systematic literature review also presents several negative aspects of working flexibly. The identified disadvantages of flexible workplaces have been categorized into occupational, private, social and financial downsides. These are depicted in figure 2.5 and this section will

Figure 2.5: Categorized downsides of flexible workplaces

Own depiction



follow the structure as presented in that figure. As these downsides are understood as critical aspects, the conceptual framework contains and deals with them. This will be further discussed in chapter 2.3.3.4.

2.2.4.3.1 Occupational downsides

One occupational downside is the reduced career development as employees are working for a company but due to working flexibly, they are literally invisible for leaders as they do not meet in person on a regular basis (Illegems et al., 2001; Kurland and Cooper, 2002; Mann et al., 2000; Maruyama and Tietze, 2012; Pratt, 1984; Taskin and Edwards, 2007; Teo et al., 1998; Tietze, 2002). Furthermore, employees get less access to required, relevant materials that are located on the company's premises, which is also a sign of inadequate staff support

(Mann et al., 2000; Teo et al., 1998). In addition, remote workers are less likely to have unlimited contracts, they work longer hours as they tend to use their commuting time for work and often work even though they are ill, which leads to increased stress coupled with declining satisfaction and loyalty (Baruch, 2000; Beasley et al., 2001; Golden, 2006a; 2006b; Harris, 2003; Illegems et al., 2001; Mann et al., 2000; Maruyama et al., 2009; Taskin and Edwards, 2007; Tomaskovic-Devey and Risman, 1993).

2.2.4.3.2 Private downsides

Referring to private downsides, family-to-work as well as role conflicts in general increase because employees are merging their private and their occupational life (Golden et al., 2006; Maruyama et al., 2009; Tietze, 2002). Therefore, boundary strategies are discussed in the literature, i.e., employees have to consider their different roles (work and private) and to what extent they want these roles to be blurred or if they want to have a strict segmentation; a boundary (Hartig et al., 2007; Kingma, 2016; Kossek et al., 2006; Lautsch et al., 2009; Sullivan and Lewis, 2001). There is no single strategy suitable for all employees as it is an individual decision, but a higher degree of merging the roles leads to more family-to-work conflicts (Kossek et al., 2006).

2.2.4.3.3 Social downsides

One of the social downsides is that isolation of employees increases as they have less face-to-face communication with their supervisors and colleagues (Baruch, 2000; Coenen and Kok, 2014; Collins, 2005; Cooper and Kurland, 2002; Harris, 2003; Illegems and Verbeke, 2004; Illegems et al., 2001; Kurland and Cooper, 2002; Lal and Dwivedi, 2009; Mann et al., 2000; Maruyama and Tietze, 2012; Teo et al., 1998; Tietze, 2002; Watad and Will, 2003). Less teamwork is another social downside as employees are not working at the same location, meaning that – according to the findings from Illegems et al. (2001) – they cannot work together, unless supported by ICT. Furthermore, less informal training of flexibly working employees is a consequence of a high degree of informal communication (Cooper and Kurland, 2002; Kurland and Cooper, 2002). Regular meetings are missing in which information is exchanged (Cooper and Kurland, 2002; Kurland and Cooper, 2002). In addition, employees feel that they always need to be reachable as they are equipped with ICT, so they have to consider the establishment of boundaries (cf. boundary management as a private downside) (Kingma, 2016; Lal and Dwivedi, 2009; Tietze, 2002).

2.2.4.3.4 Financial downsides

Moreover, costs on the part of employers increase as they need to invest in an initial set up of ICT and its network to enable employees to access it from every location (Harris, 2003; Illegems and Verbeke, 2004; Illegems et al., 2001; Mann et al., 2000; Sardeshmukh et al., 2012; Teo et al., 1998), although they worry about data and IT security issues as hardware containing sensitive data is leaving the company's facilities (Illegems and Verbeke, 2004; Illegems et al., 2001; Teo et al., 1998).

2.2.5 Justification for research: Theoretical gap and need for theory development

The systematic literature review both uncovered and confirmed a perceived theoretical gap and explores the need for theory development. In order to provide a well sounded theoretical gap, an additional narrative literature review has been conducted. The results of both literature reviews are presented in the following: first, the reasonings out of the systematic literature review and second, the reasonings out of the narrative literature review.

Nordbäck et al. (2017, p. 410) suggest that “future research should explore flexibility structures and communication flows in other countries, industry sectors and occupations” to gain a deeper understanding of how communication flows are affected by working flexibly. Moreover, a longitudinal design should be set up to analyze effects beforehand and after introducing flexible work in a company (Nordbäck et al., 2017) since cross-sectional studies do not allow drawing causal inferences. Martínez-Sánchez et al. (2007) propose to discuss organizational flexibility further by underlining the importance of gaining more knowledge about it as not all influencing factors, like ICT for example, have been researched so far (Martínez Sánchez et al., 2007). Therefore, there is a gap on combining different constructs and evaluating their relationships. The career development as well as the visibility of (especially female) teleworkers has not been studied sufficiently so far, although it is a “highly relevant issue [...] thus further research on this topic is desirable” (Maruyama and Tietze, 2012, p. 464). No additional studies on this topic were identified, leading to the assumption that still further research is required. In addition, it is important to acquire more data on how to use knowledge in increasingly flexible structures as it has to be applied by the workforce from wherever they are located and at whatever times they are working (Maruyama and Tietze, 2012). Masuada et al. (2017, p. 212) point out that further research should be conducted, referring to “indirect effects of resources and demands on engagement using goal variables”. Moreover, they also “recommend future research [to] explore what is considered ‘too much’ teleworking” (Masuda et al., 2017, p. 213). In addition to telework, there are

other forms of flexible work that should be explored to assess their correlation with engagement (Masuda et al., 2017). Mesu et al. (2013) explain that there is a need for more information about disabling factors among workers in terms of functional flexibility on the one hand and why flexibility is not higher than it is in small and medium-sized enterprises on the other. Moreover, Golden and Veiga (2008, p. 86) suggest to “examine to what extent electronic tools [...] play a contingent role” in working remotely. Martínez-Sánchez et al. (2007) also propose analyzing the access to technology. Kingma (2016, p. 191) indicates that “the spatialisation of work in third workspaces enables the continuity of work” and can also be associated with work performance. Hislop and Axtell (2009) also points out that more theoretical knowledge is required about multi-location workers that operate in public spaces because these spaces are not owned or even controlled by the employer or the employee. Moreover, further research should examine the impact of “workplace flexibility on firm performance” (Martínez-Sánchez, Pérez-Pérez et al., 2008, p. 24).

The results of the narrative literature review corroborate Kingma’s (2016) view of working apart from the company as Petrulaitiene et al. (2017, p. 153) indicate that “work is no longer a place to go to” and that the remote employee is to be examined in the future (Petrulaitiene et al., 2017). They also suggest setting up a wider focus of research which goes across company boundaries and observes the end users so “a more comprehensive workplace research” (Petrulaitiene et al., 2017, p. 154) is required. More studies have been conducted on flexitime than on workplace flexibility, although this is also relevant (Ge et al., 2018). In addition, there is a need to know how workplace flexibility affects corporate performance, so organizations can use advantages and remedy disadvantages, meaning that corporate performance is not affected negatively (Whyman et al., 2015). Furthermore, “it is worthwhile highlighting that the HRM literature does not establish clearly the theoretical (or empirical) ways in which workplace practices may affect performance” (Whyman et al., 2015, pp. 349-350). Grzywacz et al. (2008) add that workplace flexibility has also not been operationalized and conceptualized and that past research has been limited to specific organizations or the sample used was convenient. Allen et al. (2013) also state that flexplaces can be at home or different remote places and that further research is needed. Jones et al. (2008) suggest including the variables of work environment and culture into research on flexibility. Biron and van Veldhoven (2016, p. 1332) point out that remote work “may take place in other locations [than the home office], including a coffee shop, field site, or satellite office. Future research may examine whether these locations are associated with different employee outcomes”. Moreover, there is a need for future research on flexible work arrangements in SMEs (Kotey, 2017; Whyman et al., 2015).

Therefore, both literature reviews underline the need for further research in the area of flexible work, its antecedents, influencing factors and its consequences, especially in SMEs.

2.2.6 Interim conclusion

The systematic literature review as well as the additionally conducted narrative literature review aimed at (1) uncovering and identifying relevant gaps in the literature on working flexibly, (2) identifying and structuring downsides of working flexibly and (3) setting the foundation for the development of a conceptual framework based on the uncovered relationships within the literature reviews.

Summarizing the identified gaps, there is a lack of theoretical knowledge on how *all* WFPs affect each other and how they are associated with performance (on various levels, i.e., individual or organizational), especially in SMEs. In addition, the topic of ICT is underrepresented in previous research and requires special attention as it enables more people to work flexibly. This is particularly interesting with reference to the developments of technology in the past, i.e., the implementation of portable computers (laptops, tablets) as well as smartphones in companies. What is needed, therefore, is broader research that does not always focus on just one or a few companies or on some WFPs, but provides a broad overview of the effects of WFPs in many companies, especially SMEs. So far, only certain constructs have been analyzed since an all-encompassing conceptual framework is missing, which will be developed in the following chapters. Therefore, a gap is clearly identified and specified.

Four categories of downsides regarding working flexibly were identified, namely occupational (e.g., reduced career development or be working while others are ill), private (e.g., role conflicts or boundary management), social (e.g., isolation or the need of always being reachable) and financial (increased costs regarding IT). These contain several downsides, either related to the company (e.g., additional costs for initial ICT investments) or to employees (e.g., feeling isolated). In order not to suffer from the downsides of working flexibly, remedies for all downsides have to be identified and implemented in a conceptual framework as well. Hereby the foundation for an all-encompassing framework has been laid. This all-encompassing framework enables researchers to make a clear justification on why (not) to include a certain construct in their study. So, it serves as a guideline/roadmap for further research. Furthermore, it provides a comprehensive understanding of the whole topic by presenting the underlying relationships. Therefore, the downsides can possibly be remedied while the advantages can be used for enhancing performance (again on various levels) by retaining a sustainable competitive advantage as a company. The development of the conceptual framework will be described in the next chapter.

2.3 Development and presentation of the conceptual framework

Referring to Miles and Huberman (1984, p. 28), “a conceptual framework explains, either graphically or in narrative form, the main dimensions to be studied – the key factors, or variables – and the presumed relationships among them”. A conceptual framework needs to be “constructed, not found [in the literature]” (Maxwell, 2009, p. 223) but it descends from the theoretical framework what constitutes a structure of information obtained from literature (Eisenhart, 1991; Eisenhart and Jurow, 2011; Kumar, 2014; Marshall and Rossman, 2016). Jabareen (2009, p. 51) defines a “conceptual framework as a network, or “a plane,” of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena”. The sizes and forms vary as frameworks can be causal, descriptive, commonsensical or theory-driven, elaborate or rudimentary (Miles and Huberman, 1984). It summarizes the assumptions, concepts, theories, beliefs and expectations of research but in a wider sense so actual (un)written beliefs and ideas about the phenomena of interest are included (Maxwell, 2009). Moreover, it describes what is going on from the point of view of the researcher regarding the studied phenomena (Maxwell, 2009). As a differentiation from the theoretical framework, the conceptual framework usually concentrates on the parts that are to become the foundation of the study and only relate to a specific research problem (Kumar, 2014). So, it is a “skeletal structure for organizing or guiding a new study” (Eisenhart and Jurow, 2011, p. 712). Furthermore, its heuristic value is high if questions or ideas are generated which lead to informative, valuable, and interesting studies (Teddle and Tashakkori, 2009). A modification or reconceptualization of conceptual frameworks is possible if new texts and data indicate a need to do so (Jabareen, 2009). Therefore, conceptual frameworks are non-static (Jabareen, 2009). Each concept which is included in the conceptual framework performs an ontological as well as epistemological role on the one hand (Jabareen, 2009). On the other, the conceptual framework as a whole has underlying ontological, epistemological and methodological presumptions (Jabareen, 2009).

The initial conceptual framework for this research is derived and constructed from the analyzed literature within the systematic as well as narrative literature review. Moreover, it is based on the flexibility firm theory (Rodgers, 1992) as well as the Job Demands-Resources Model (JD-R) (Bakker and Demerouti, 2007; Xanthopoulou et al., 2007). It concentrates on the research questions as well as the aim and objectives. It will be explained in detail after a brief description of the two aforementioned theories.

2.3.1 Flexibility firm theory

Rodgers (1992) states that employee efficiency increases if employees have a high degree of flexibility. Originally, this relates to work from home, so employees can combine working for the company with private matters (e.g., caring for the family) (Rodgers, 1992). Therefore, Rodgers (1992, p. 197) underlines the value of offering flexibility to employees as it on the one hand motivates the most ambitious and talented employees, binds them to the company and it “is a natural compliment to such workers”. On the other hand, offering flexibility is a competitive advantage in recruiting and retaining employees whose “importance cannot be overstated” (Rodgers, 1992, p. 196). However, the positive aspects will only arise if the organization and its leadership support their employees in working flexibly (Rodgers, 1992). The companies are motivated to bind their employees, so they offer the flexibility based on a strategic decision (Rodgers, 1992). So, it does not privilege individuals with special needs or interests, but is a strategic part of human resource management, by emphasizing the management of human resources in order to link business and private interests stronger for achieving an increase in productivity (Rodgers, 1992). The theory has been enhanced recently, as Chatterjee, Chaudhuri and Vrontis (2022) not only concentrate on work from home but have also widened their focus to include working from any location. This meets the current reality in which employees can work from various locations, while all other assumptions remain.

2.3.2 Job Demands-Resources Model

Referring to Bakker and Demerouti (2007), the JD-R differentiates between job resources and job demands, i.e., physical, social, organizational, or psychological characteristics of work for which psychological as well as physical skills and costs are required in order to deal with these aspects. Job resources are related to achieving goals connected with work, e.g., support, feedback or autonomy. In general, job demands are positively associated with strains (i.e., which are negatively associated with organizational outcomes) while job resources are positively related to motivation which is also positively linked with organizational outcomes (Bakker and Demerouti, 2007). In addition, the relationship between job demands and strains is moderated by job resources, i.e., if the resources are high, the relationship between job demands and strains decreases (Bakker and Demerouti, 2007). Also, the relationship between job resources and motivation is moderated by job demands, i.e., if the demands are high, the relationship between job resources and motivation declines (Bakker and Demerouti, 2007). Moreover, personal resources like self-efficacy or optimism are positively related to work engagement, i.e., dedication or vigor (Xanthopoulou et al., 2007).

With reference to this study, autonomy as a job resource is of paramount interest as employees – if they work flexibly – are highly autonomous regarding their work times and locations. Thus, the motivation of employees increases, leading to higher outcomes due to working flexibly, based on the JD-R (cf. Bakker and Demerouti, 2007).

2.3.3 Initial conceptual framework

The systematic as well as the narrative literature review uncovered existing models in the research area of WFPs. Some of these are on an individual level (focusing on employees), for instance Masuada et al. (2017), Maruyama and Tietze (2012) and Mann et al. (2000) and a lot of studies are on organizational level (focusing on employers/companies), e.g., Whyman and Petrescu (2015), Whyman et al. (2015), Martínez-Sánchez, Pérez-Pérez et al. (2008) and Martínez-Sánchez et al. (2007). But none of the identified models are able to answer the research questions, the aim and the objectives as well as the already identified theoretical gaps (no study researches all WFPs in a variety of companies, especially in SMEs) of this study. This again highlights the need for research as a new theoretical contribution to knowledge which leads to the development of a new conceptual framework. The two studies with its models which come closest to this study are the ones by Martínez-Sánchez, Pérez-Pérez et al. (2008) as well as Whyman and Petrescu (2015). But as both studies have weaknesses which will be further explained below, the new framework, developed in this study, eradicates them. The two aforementioned models will be discussed critically now while Whyman and Petrescu's (2015) model is the guiding model for the further studies (i.e., different stages of the mixed methods research design), as it also focuses on SMEs.

Whyman and Petrescu (2015) conducted a study of WFPs with a focus on British SMEs during a recession, which contrasts with Martínez-Sánchez, Pérez-Pérez et al. (2008) who studied large Spanish firms (over 250 employees). Therefore, insights from research of Whyman and Petrescu (2015) were used while the initial conceptual framework was developed, as this study focuses on German SMEs (without the aspect of being in a recession). According to Whyman and Petrescu (2015), the study was conducted in a very disaggregated manner, in which regressions of individual items have been analyzed instead of relationships of constructs. This should lead to a differentiated analysis and objective dependent variables because these were directly observable (redundancies, absenteeism and financial turnover). However, more complex data analyses have not been applied as the generated data did not allow any more differentiation. So, there were many missing values and a response of only 135 questionnaires from SMEs in total from which a maximum of $N = 111$ were usable,

leading to a low statistical power. Nevertheless, complex statistical analysis would have led to a more complete picture with interrelations of constructs instead of solely analyzing every possible relationship on item level. Although they analyzed their data in a disaggregated way on item level instead of using complex constructs (which is emphasized often), they combined several workplaces in their analysis which does not follow the overall idea of disaggregation, i.e., there is one item which combines home, telework and mobile work but – besides the aggregated consideration – the workplace within the company's facilities is missing. This has been classified as the second workplace by Kingma (2016). Referring to the model from Whyman and Petrescu (2015), the disaggregated view has also not been followed without reasoning when numerical flexibility was analyzed since this is dividable into internal and external numerical flexibility (Grenier et al., 1997; Martínez-Sánchez et al., 2011). By having a closer look at how location flexibility influences SME performance indicators, Whyman and Petrescu (2015) uncovered that having location flexibility leads to a smaller financial turnover (*correlation coefficient* = $-.725$, $p < .1$) and to higher rates of absenteeism (*correlation coefficient* = $.386$, $p < .01$). This is probably explained by a greater willingness to shirk, caring for children and an increase in conflicts with the family, which highlights that location flexibility has negative factors (Whyman and Petrescu, 2015). To sum this up, the study reveals in a very narrowed and differentiated way how single aspects of WFPs are related to SME performance indicators without analyzing the impact of the WFPs in total (constructs instead of items) on SME performance indicators in a combined model due to weak data. Additionally, Whyman and Petrescu (2015) highlight the relevance of studying all WFPs but do not include external numerical flexibility, as well as procedural flexibility. Therefore, they “conclude that more lessons need to be learned in terms of managing workplace flexibility in SMEs” (Whyman and Petrescu, 2015, p. 1118).

According to Martínez-Sánchez, Pérez-Pérez et al. (2008), relationships between the higher order construct HR commitment practices (which is understood as an employers' commitment against employees; $\beta = .240^{**}$) as well as HR social benefits ($\beta = .347^{**}$) on telework (percentage of workforce that teleworks, $R^2 = .388$) are significant and positive⁷. Moreover, the constructs core employees ($\beta = .191^*$) and (expected) employees' turnover ($\beta = .314^{**}$) are also positively related to telework and significant. In addition, they also included three WFPs in their model, namely functional flexibility, internal numerical flexibility and external numerical flexibility (here differentiated in contrast to Whyman and Petrescu (2015)) which on the one hand are related to the telework construct (except from external numerical

⁷ p value of $*p < .05$ or $**p < .01$

flexibility) and on the other hand (like the telework construct) they are related to the target construct of firm performance (higher order construct, formed by financial, innovation and relational performance, $R^2 = .232$). The relationship between telework and firm performance is also significant and positive ($\beta = .284^{**}$) and implies that an increased usage of telework leads to higher corporate performance as employees possess the flexibility to adapt tasks to their own needs and desires, making them more satisfied (Bhattacharya et al., 2005; Martínez-Sánchez et al., 2008). This is in line with the literature, as for instance the flexibility firm theory proposes the same link (Chatterjee, Chaudhuri and Vrontis, 2022; Rodgers, 1992). Referring to Martínez-Sánchez, Pérez-Pérez et al. (2008), the relationships of the WFPs on telework provided different results as the relationship between internal numerical flexibility and telework is neither significant nor weak ($\beta = .057$). In this regard, the construct focuses on flexible working time but excludes flexible workplaces, like telework. In studies from other researchers, flexible workplaces are included in the internal numerical flexibility construct (cf. Whyman and Petrescu, 2015; Poethke et al., 2019) which underlines the variety of definitions for the different WFPs. However, the relationship between functional flexibility and telework is again positive and significant ($\beta = .267^{**}$). All relationships between WFPs and the target construct are significant at a p-value of 0.05 but vary regarding their polarity (functional flexibility: $\beta = .240^*$; internal numerical flexibility: $\beta = .158^*$; external numerical flexibility: $\beta = -.167^*$). Although nine significant relationships are analyzed through this model, it is criticizable as the researchers and therefore developers of the model themselves question the relationships stating that no qualitative research has been conducted to deeply understand underlying mechanisms, on the one hand. On the other, the authors state that it is important “to evaluate the impact of telework and other workplace flexibility on firm performance” (Martínez-Sánchez et al., 2008, p. 24). Methodological/causal biases are not discussed in that study which is understood as a major limitation as low sample sizes tend to have low statistical power. Furthermore, cross-sectional research designs typically do not explain causality but correlation which limits the interpretation of results. Moreover, the aspect of endogeneity (omitted variables are influencing more than just one construct (Antonakis et al., 2010)) are not discussed, leading to the assumption that endogeneity has not been considered. This again limits the interpretation of the results.

Both articles use WFPs, but both do not study all of them, although previous research pointed out that it is important to study workplace flexibility as a whole (Whyman and Petrescu, 2015; Whyman et al., 2015). Moreover, both studies ignore the issue of leadership, although the systematic literature review has shown that this topic is relevant in the context of WFPs (Bean and Hamilton, 2006; Golden, 2006b; Golden and Veiga, 2008; Mesu et al., 2013). By

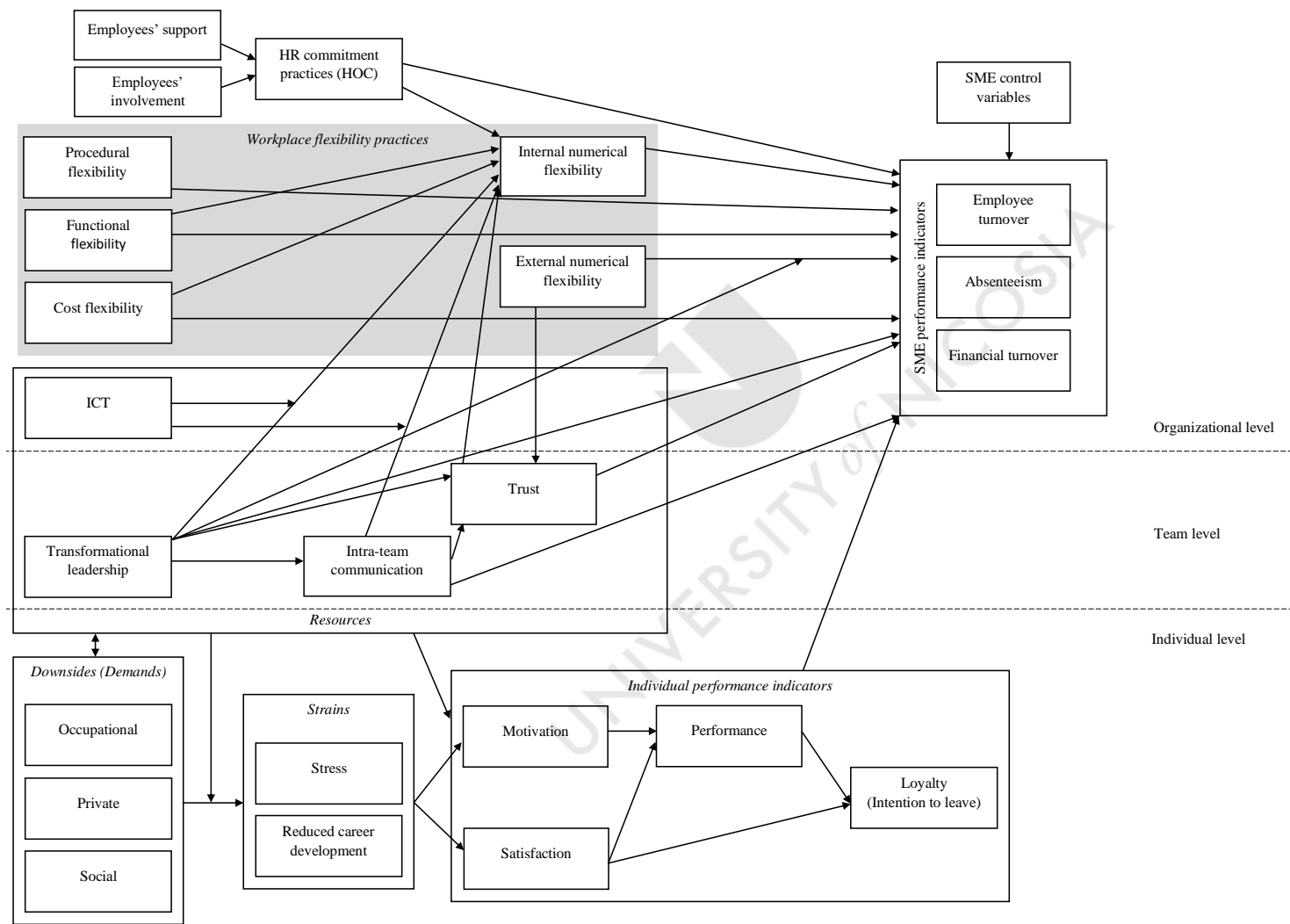
not including leadership in their studies, it remains unclear how leadership affects the usage of WFPs. Moreover, this could lead to a bias in their models as they might be hiding a significant construct, leading to an issue concerning endogeneity. Admittedly, it is not easy to measure leadership at the organizational level, but it is nevertheless possible to do (cf. Moon, 2016; Oberfield, 2014).

The new initial conceptual framework eradicates the weaknesses of existing models (discussed in more detail when the framework will be described), it fulfills the aforementioned theoretical gaps, takes the downsides of flexible workplaces in consideration and it constitutes a new contribution to knowledge. First, it will be visualized as a multilevel framework (cf. figure 2.6) for serving a better comprehensibility and second, it will be explained in detail.

The model contains three different levels: organizational, team and individual level, integrating and all evaluated downsides from the systematic literature review on one of these levels. The constructs in the upper third of the conceptual framework concentrate on aspects that are measurable and implementable on an organizational level, namely workplace flexibility practices, HR commitment practices, information and communication technology (ICT), SME performance indicators and SME control variables. The second third of the conceptual framework focuses on constructs which are typically measured on a team-level as they affect rather the team than an individual or are agreed on in a team, namely transformational leadership (one leader leads a team), intra-team communication (communication cascades within a team) and trust (fostered by a leader within his/her team). The last third deals with aspects that are related to individuals/employees, namely: occupational, private and social downsides, stress, reduced career development as well as individual performance indicators.

Figure 2.6: Initial conceptual framework of workplace flexibility practices, transformational leadership, trust and intra-team communication on SME performance indicators

Own depiction



HOC = Higher order construct

In order to provide an overview of the constructs, the following table 2.4 contains a short definition of each construct (alphabetical order and ascending).

Table 2.4: Overview of constructs and its definitions

Own table

| Construct | Definition |
|-----------------------------------|---|
| Cost flexibility | This workplace flexibility practice explains different remuneration systems, which can be applied within a company to adjudge the payments (Whyman and Petrescu, 2015). |
| Downsides | The downsides of flexible workplaces have been categorized in occupational (related to the profession), private (related to private life) and social (related to interpersonal aspects) downsides. |
| External numerical flexibility | It refers to the usage of “changes in the external labour market”, i.e., the labor market outside the company (Martínez Sánchez et al., 2007, p. 46) for (temporarily) adjusting the workforce size (Martínez-Sánchez et al., 2011). |
| Functional flexibility | According to Martínez-Sánchez, Vela-Jiménez et al. (2008, p. 650), “functional flexibility means a process through which firms adjust to changes in the demand for their output by an internal reorganization of workplaces based on multiskilling, teamworking and the involvement of employees in job design and the organization of work”. |
| HR commitment practices | HR commitment practices express the employers’ commitment to the employees (Martínez-Sánchez, Pérez-Pérez et al., 2008). |
| ICT | Information and communication technology is in this case understood as an enabler for communication. |
| Individual performance indicators | The individual performance indicators describe the performance of an employee (qualitatively, e.g., satisfaction, and quantitatively, e.g., output) at the individual level, i.e., not in relation to the entire team or company. |
| Internal numerical flexibility | Internal numerical flexibility is defined as an adjustment of the company’s internal work organization concerning changes that justify different working hours or locations (Martínez-Sánchez et al., 2011; Martínez-Sánchez, Vela-Jiménez et al., 2008). |

| | |
|-----------------------------|--|
| Intra-team communication | Intra-team communication can be defined as an information exchange, via (non)verbal channels (e.g., email) of two or more team members (Marlow et al., 2018; Mesmer-Magnus et al., 2011). |
| Procedural flexibility | Procedural flexibility “involves establishing within the enterprise a machinery for consultation or negotiation upon the other aspects of internal labour market flexibility” (Rimmer and Zappala, 1988, p. 568). |
| SME performance indicators | These measure the performance of small and medium-sized enterprises, defined here by employee turnover, absenteeism and financial turnover (cf. Whyman and Petrescu, 2015). |
| Strains | Strains are the consequence of an imbalance between the demands to which employees are subjected and their available resources (Bakker and Demerouti, 2007), in this case stress and reduced career development. |
| Transformational leadership | Transformational leadership focuses on the change of “basic values, beliefs, and attitudes of followers so that they are willing to perform beyond the minimum levels specified by the organisation” (Podsakoff et al., 1990, p. 108). |
| Trust | Mayer et al. (1995, p. 712) define trust as “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party”. |

2.3.3.1 Organizational level

2.3.3.1.1 SME performance indicators

There is a long discussion of how to measure business performance. Venkatraman and Ramanujam (1986) differentiate between financial performance (a reflection of the achievement of the business's economic objectives) and operational performance (broader understanding of performance from a nonfinancial perspective). Financial indicators are based on outcomes and point out, if the company's goals (set in the past like profitability) could have been achieved (e.g., profit per share, sales growth) while operational performance measurements are nonfinancial, e.g., introduction of new products, quality of products, effectiveness of marketing (Venkatraman and Ramanujam, 1986). These operational performance items

are highly relevant key success factors (depending on the research interest/area) which could result in financial performance (Venkatraman and Ramanujam, 1986). In some cases, it may be necessary to measure organizational effectiveness, although “it appears that most strategy studies have restricted their focus” on financial and operational performance measures (Venkatraman and Ramanujam, 1986, p. 804). The data for the business performance measurement can be primary (data generated by a researcher for a specific purpose) or secondary (already generated and therefore available) data (Venkatraman and Ramanujam, 1986). As this study aims at generating primary data, the secondary data will not be discussed at this point. The combination of financial as well as operational indicators, based on primary data, operationalizes business performance in a comprehensive way (Venkatraman and Ramanujam, 1986). Moreover, the indicators must be relevant for the industry and they must address theoretical as well as empirical dimensionalities (Venkatraman and Ramanujam, 1986).

To be in line with the research questions, aim, objectives and to construct a conceptual framework that is capable of dealing with the desired sample (SMEs in Germany), three SME performance indicators are used to measure corporate performance as the target construct. The firm performance construct (used by Martínez-Sánchez, Pérez-Pérez et al. (2008)) is not being used as their model focuses on big companies. So, the SME performance indicators in this conceptual framework are inspired by the three performance indicators used by Whyman and Petrescu (2015), as their study was designed for SMEs (in a recession). They measured corporate performance via redundancies, absenteeism and financial turnover and point out that all three indicators have been validated to measure several types of performance as correlation indexes are lower than 0.3 (Whyman and Petrescu, 2015). Financial turnover is an item for measuring corporate performance which is objective and does therefore not suffer reliability issues as well as (inherent) interpretation problems (Whyman and Petrescu, 2015; Whyman et al., 2015). Redundancies and absenteeism are quantifiable as well and therefore reliability problems are eliminated, which are likely to arise when using subjective performance indicators (e.g., job satisfaction) (Whyman and Petrescu, 2015).

Absenteeism is defined as “the failure to report to work as scheduled” (Johns, 2008, p. 160). Breugh (1981) defines absenteeism as the number of days at which an employee does not attend to work, i.e., is absent. Therefore, employees might be absent due to a variety of reasons like illness (mental or physical), sabbatical, holidays, parental leave and others (Winnen, 2015). Literature differentiates between absenteeism due to sickness or due to simulating illness, representing a lack of motivation (Baron, A., 2011; Caverley et al., 2007; Luz and Green, 1997). Therefore, absenteeism may interfere with work schedules or cause the

need for a short-term replacement (Ruhle and Süß, 2020). The counterpart of absenteeism, so-called presenteeism meaning employees attend at work although they are ill (Johns, 2010), is as negative as absenteeism because it results in increased illnesses and reduced productivity (Dew et al., 2005; Prater and Smith, 2011). So, if absenteeism occurs, employees and employers suffer (Valentine et al., 2019), underlining the relationship between absenteeism and (in)voluntary turnover (Keller, 1984; Stumpf and Dawley, 1981). Absenteeism has only seldom been studied in linkage to WFPs (Whyman and Petrescu, 2015). In the study from Whyman and Petrescu (2015) absenteeism is defined as the number of missing working days for each employee during the last 12 months. Excluded are working days lost as a result of approved leave, participation of employees in courses or secondments, or due to labor disputes.

As the study by Whyman and Petrescu (2015) concentrates on companies in a recession, they use the item redundancies, meaning make employees redundant/lay them off. This conceptual framework does not focus on companies in situations of corporate crises. Due to this, employee turnover is used as a SME performance indicator, replacing redundancies. Employee turnover has a long-standing tradition in HR research and can be both employee- or employer-driven (Arthur, 1994; Guthrie, 2001; Huselid, 1995). Therefore, it is broader than redundancies, as it does not only focus on employers dismissing employees of but also on employees who leave the company because they wish to do so (Arthur, 1994; Guthrie, 2001; Huselid, 1995). In addition, both – turnover as well as absenteeism – are the proxy-variables used in the conceptual framework for motivation as it affects both of these variables (Banerjee, 2018; Berthel and Becker, 2013; Tirrel and Winnen, 2018b). Furthermore, on an organizational level with this complexity, no suitable measure for motivation was found in the literature which could have been applied because motivation is an individual aspect and therefore typically measured individually (Huang et al., 2010; Marin-Garcia and Martinez-Tomas, 2016). SME performance indicators are measured over an annual period of time (Whyman and Petrescu, 2015).

2.3.3.1.2 Workplace flexibility practices

In contrast to the above-mentioned studies, this initial conceptual framework contains all WFPs, namely: procedural flexibility, functional flexibility, cost flexibility as well as the internal and external numerical flexibility. WFPs are defined as “to encompass both employee and organizational perspectives, as a large number of work arrangements and patterns aimed to enable employees and employers to adjust corporate activities in order to adapt to the demands of the working life and the economic climate” (Whyman and Petrescu, 2015,

p. 1098). However, no agreed definition in the literature exists as a consequence of its possibilities in using them, i.e., in companies, by governments or practitioners (Hill et al., 2008; Whyman and Petrescu, 2015). Generally speaking, WFPs are used to create high performance work practices (bundle of individual HR practices at strategic level since employees are less exposed to individual practices but rather to HR practices (Jiang et al., 2012)) which are part of human resource management and highlight the relationship between human resource management practices as well as corporate performance (Jiang et al., 2012; Stavrou et al., 2010; Whyman et al., 2015). As WFPs are also a part of human resource management literature, theoretical underpinnings are comparable because both are founded on workplace practices (Whyman et al., 2015). Human resource management literature states that human resource management practices should be inimitable, rare as well as valuable resources for organizations (Huselid, 1995; Stavrou et al., 2010; Wright et al., 2001), which is in association with Barney's (1991) resource-based view. Due to this, WFPs are understood as an opportunity for creating a sustainable competitive advantage that is rare, not substitutable, not imitable and of a certain value for companies, implying that WFPs are highly strategically relevant (Barney, 1991; Whyman et al., 2015). Rastogi et al. (2018) show that by offering more flexibility to employees their quality of work life, i.e., the extent to which the employee can satisfy his or her needs through on-the-job experience, increases. They therefore conclude that flexibility can result in positive achievements for employees, society and for employers (Rastogi et al., 2018). Moreover, WFPs include the organization's as well as the employee's perspective (Whyman and Petrescu, 2015, p. 1098). Therefore, it is important to know and to understand which of the WFPs, alone or in combination, lead to a sustainable competitive advantage, i.e., higher corporate performance. It is even more important to put light on this link, as there is no clear understanding of how WFPs influence corporate performance – neither theoretically nor empirically (Whyman et al., 2015).

Internal numerical flexibility will now be described first, as this construct is placed in the center of the initial conceptual framework.

2.3.3.1.2.1 Internal numerical flexibility

Numerical flexibility (also called temporal flexibility) is dividable into internal as well as external numerical flexibility (Grenier et al., 1997; Martínez-Sánchez et al., 2011). The construct of internal numerical flexibility is defined as an adjustment of the company's internal work organization concerning changes that justify different working hours or locations (Martínez-Sánchez et al., 2011; Martínez-Sánchez, Vela-Jiménez et al., 2008). So, it is possible for a business unit or an individual to work longer/fewer hours, by swiftly anticipating

opportunities (like new chances at the market) or problems (customer cancels order) (Kok and Ligthart, 2014). Therefore, work time is a relevant aspect of internal numerical flexibility (Kok and Ligthart, 2014). Moreover, its usage is cheaper than to hire or fire employees and companies can react more quickly to requirements of their product markets (Kok and Ligthart, 2014). Furthermore, it can be more beneficial to temporarily decrease working hours instead of losing (due to firing) highly qualified employees (Kok and Ligthart, 2014). In addition, aspects of job sharing and the location of the workplace are included in the workplace flexibility practice of internal numerical flexibility (Whyman et al., 2015). Grzywacz et al. (2008, p. 200) point out that “flexibility [...] provides a concrete lever to organizations for enhancing organizational performance”. The flexibility firm theory (Chatterjee, Chaudhuri and Vrontis, 2022; Rodgers, 1992) supports this finding, so a relationship between internal numerical flexibility and SME performance indicators is expected.

2.3.3.1.2.2 External numerical flexibility

In addition to internal numerical flexibility, there is a construct called external numerical flexibility. This workplace flexibility practice refers to the usage of “changes in the external labour market”, i.e., the labor market outside the company (Martínez Sánchez et al., 2007, p. 46). Therefore, external numerical flexibility can be used to adjust the workforce size by contracting or firing temporarily employed employees (Martínez-Sánchez et al., 2011) and is grounded in the status of employment (Wickramasinghe et al., 2019) which in this case are typically not full-time and regular employees (Voudouris et al., 2017). Costs for recruiting, training as well as hiring are lower in cases of temporary and fixed-term employees in contrast to permanent employees (while the labor costs are higher) and capacity can be managed more efficiently (Kalleberg and Marsden, 2005). In general, core employees are trained more often than temporal or fixed-term employees (Mitlacher, 2008). If fixed-term and temporary employees are working in a company it may be beneficial in cases of reducing labor costs, but their organizational commitment is lower than of permanent employees (Kulkarni and Ramamoorthy, 2005; Michie and Sheehan, 2005; Posthuma et al., 2005). Organizational commitment can be understood as a force which binds employees to organizations (Allen, N. J. and Meyer, 1990; Meyer and Herscovitch, 2001). Furthermore, there is a risk that internal employees feel a fear of being replaced when others are rent from an agency (Boyce et al., 2007). Moreover, fixed-term employment contracts may be associated negatively with trust (Svensson, 2012; Voudouris et al., 2017). In addition, temporary employees have lower performances, their behavior is counterproductive (Posthuma et al., 2005) and it negatively affects the relationship between employees and managers (Davis-Blake et al., 2003). The

beneficial aspect of contingent employees is that they function as a buffer to the standard employees which reduces fluctuation and leads to a secure employment (Way et al., 2010).

External numerical flexibility is associated with corporate performance because core-employees take over core-activities and minor aspects can be sourced out as indicated by Martínez-Sánchez, Pérez-Pérez et al. (2008). Because of the before-mentioned (negative) aspects, external numerical flexibility is negatively related to corporate performance (Martínez-Sánchez, Pérez-Pérez et al., 2008). Based on the findings from Connelly and Gallagher (2004) the relationship is expected to be moderated because temporary or fixed-term employees need to be motivated and led as well as core-employees. Transformational leaders have therefore the possibility to enhance individual performance (and therefore company performance in the end) by caring for temporary or fixed-term employees who might even stay longer in a company than permanent employees due to downsizing, i.e., making use of external numerical flexibility (Connelly and Gallagher, 2004). Therefore, the anticipated moderation will also be incorporated in the initial conceptual framework.

2.3.3.1.2.3 Functional flexibility

A construct which is expected to be related to internal numerical flexibility is functional flexibility. “Functional flexibility means a process through which firms adjust to changes in the demand for their output by an internal reorganization of workplaces based on multi-skilling, teamworking and the involvement of employees in job design and the organization of work” (Martínez-Sánchez, Vela-Jiménez et al., 2008, p. 650). This construct describes the harmonization of job contents and the workers' deployment (Kok and Ligthart, 2014; Whyman et al., 2015). Therefore, functional flexibility covers topics like multi-skilled teams or job rotation and leads to a workforce which is able to better adapt to specific tasks (Martínez-Sánchez, Pérez-Pérez et al., 2008). So multi-skilled teams with a broader distribution of knowledge are based on trained individuals, willing to improve their own skills (Martínez-Sánchez et al., 2011). Furthermore, through functional flexibility, repetitiveness and monotony can be reduced which in consequence leads to an improved working life quality (Martínez-Sánchez, Vela-Jiménez et al., 2008). In addition, employees can be involved in job planning as well as job design as functional flexibility is associated with high performance work practices (multi-skilled teams) and human resource management can improve it via training (Martínez-Sánchez, Pérez-Pérez et al., 2008; Martínez-Sánchez, Vela-Jiménez et al., 2008). Developing its core employees leads to higher costs, but loyalty to the company increases (Kelliher and Riley, 2003).

Martínez-Sánchez, Pérez-Pérez et al. (2008) presented in their study a positive relationship between functional flexibility and telework, since a high degree of functional flexibility reflects a well-qualified workforce. Functional flexibility requires high performance work practices where employees participate in job design, work in multi-skilled teams and are unlikely to be redeployed to another section with a high demand for work (Desombre et al., 2006; Martínez-Sánchez, Pérez-Pérez et al., 2008). So, if the degree of functional flexibility is high (the workforce is highly qualified) the internal numerical flexibility will increase because a high-performance workforce is more often allowed to work flexibly (Martínez-Sánchez, Pérez-Pérez et al., 2008). This is again supported by the flexibility firm theory as enhancing flexibility motivates and retains employees, leading to better outcomes (Chatterjee, Chaudhuri and Vrontis, 2022; Rodgers, 1992). As telework was replaced by internal numerical flexibility (containing several work locations as items), inspired by Whyman and Petrescu (2015), a positive relationship is expected between functional flexibility and internal numerical flexibility. Furthermore, previous studies indicate that functional flexibility is also directly related to corporate performance (Martínez-Sánchez, Pérez-Pérez et al., 2008; Whyman and Petrescu, 2015). Some results show that higher functional flexibility lowers the corporate performance in SMEs as, for example, the word teamwork might be misunderstood by managers (including every task instead of real teamwork) while others point out the counterpart (reduced rates of absenteeism per year due to functional flexibility practices like training/job enrichment, job sharing and job security) (Whyman and Petrescu, 2015). Job security (as a part of functional flexibility) leads furthermore to higher financial turnover as a consequence of longer job tenures which are associated with higher employee performance as the human capital increases (Tirrel and Winnen, 2018; Whyman and Petrescu, 2015). Moreover, job sharing was identified as the item that leads to the lowest rates of absenteeism, highlighting the potential (Whyman and Petrescu, 2015). That the results of the study by Whyman and Petrescu (2015) are sometimes intriguing may be a consequence of studying in a recession. Therefore, “further fieldwork would be required to determine the true cause” (Whyman and Petrescu, 2015).

2.3.3.1.2.4 Procedural flexibility

The construct of procedural flexibility is also included in this initial conceptual framework. Other models like the one by Martínez-Sánchez, Pérez-Pérez et al. (2008) as well as the one by Whyman and Petrescu (2015) are lacking this construct, although the last study highlights the importance of studying all WFPs. Procedural flexibility “involves establishing within the enterprise a machinery for consultation or negotiation upon the other aspects of internal

labour market flexibility” (Rimmer and Zappala, 1988, p. 568). So, it is possible that unionists appear in negotiations of issues which concern the whole workforce (collective viewpoint) (Rönmar, 2006). Therefore, “decision-making processes adhere to a number of specific rules” (Zapata-Phelan et al., 2009, p. 94). In the individual dimension, employers are able to directly discuss working conditions with employees (Buultjens and Howard, 2001; Rönmar, 2006). Studies show that engaging with individual as well as collective procedural flexibility (e.g., through the establishment and the opportunity to take part in decision-making processes of unionists) is recommended (Deakin, 1998). According to Buultjens and Howard (2001), less procedural flexibility leads to institutions becoming more powerful which ultimately results in a systematic irresponsibility of unionists as well as managers. Moreover, a more cooperative attitude as well as a superior work culture are the consequences of higher procedural flexibility (Buultjens and Howard, 2001). Referring to Stewart and Spatz (1993), there are positive relationships between procedural flexibility and employees’ commitment and between procedural flexibility and performance (Addison and Teixeira, 2003; Stewart and Spatz, 1993; Zapata-Phelan et al., 2009), as management alone does not make decisions. According to Addison and Teixeira (2003), productivity increases when a protection mechanism exists, that means employees cannot be easily dismissed. This helps to foster good relations among employees and there can be more investment in training as an exorbitant staff turnover is avoided.

So, there are both strong and weak decision-making related to procedural flexibility (i.e., there is a decision-making process through the management, or a consultation process) (Bamber, 1992; Rimmer and Zappala, 1988). In this respect, if the procedural flexibility is low, the responsibilities as well as the scope of unionists and workplace managers is also low while an increased procedural flexibility is associated with a cooperative and therefore better workplace culture (Buultjens and Howard, 2001). Procedural flexibility is, therefore, a managerial prerogative which comes in line with individual contracts of employment, but a cooperation with trade unions or other worker representatives is not excluded (Campling, 1995; Deakin, 1998; Rönmar, 2006). To sum this up, “procedural flexibility is the ability to introduce changes” (Budd, 2004, p. 215).

2.3.3.1.2.5 Cost flexibility

The fourth workplace flexibility practice is cost flexibility. This workplace flexibility practice explains different remuneration systems, which can be applied within a company (Whyman and Petrescu, 2015). Referring to Eamets and Jaakson (2014), cost flexibility reflects how employer and employee use their power in situations of negotiating the income.

Moreover, cost flexibility (also called wage flexibility) explains how payment is adjudged (Whyman and Petrescu, 2015). The literature points out that there are positive relationships between cost flexibility as well as corporate performance (Whyman et al., 2015), giving the reason for including cost flexibility in this study. Eamets and Jaakson (2014, p. 748) pinpoint that “there is still little research on interactions between spatial mobility and labour market flexibility”. In this case, spatial mobility refers to working in different locations and labor market flexibility is described as the reaction to changes in the economy (Eamets and Jaakson, 2014). Due to cost flexibility, employees can be retained by a company, so employee turnover can be reduced as a consequence of incentives, thereby motivating employees (Martínez-Sánchez et al., 2008). Gittleman et al. (1998) state that companies that offer a vast selection of cost flexibilities were also more willing to adopt flexible working practices. In the study by Martínez-Sánchez, Pérez-Pérez et al. (2008) two items were used to measure (in)direct compensation and the construct was called HR social benefits with a weak Cronbach’s alpha value of .626. Furthermore, Whyman and Petrescu (2015) highlight the importance of researching the different WFPs and Martínez-Sánchez, Pérez-Pérez et al. (2008) omit cost flexibility in their model, but study HR social benefits (that include some cost flexibility practices), which are positively related to telework. This study indicates a positive relationship between cost flexibility and internal numerical flexibility. If more (in)direct compensation is given to employees, the use of an alternative workplace (in this case, telework) increases as employees recognize the company’s engagement which makes it easier for employees to work flexibly (Martínez-Sánchez, Pérez-Pérez et al., 2008). Furthermore, companies must understand the needs of employees (and vice versa) in order to remain a motivated geographically dispersed workforce, which in this case is reflected by the employees’ access to cost flexibility practices (as an antecedent of internal numerical flexibility) (Martínez-Sánchez et al., 2008). Gittleman et al. (1998) conclude that companies which offer cost flexibility are more likely to also use other flexibility practices, like internal numerical flexibility. Costs must be cut or performance must be increased, if the demand for products is weaker (Whyman and Petrescu, 2015). So other work locations can be used as an indirect reward as telework is also associated with being privileged (Lautsch et al., 2009) and it is associated with lower costs (Mann et al., 2000). Moreover, companies that adopt telework use more flexibility practices (Martínez Sánchez et al., 2007). This information, combined with the statement by Eamets and Jaakson (2014) (there is little knowledge about the interactions between spatial mobility and employment market flexibility), justifies the inclusion of this relationship.

The study by Whyman et al. (2015) states that cost flexibility is related directly to performance. Moreover, Whyman and Petrescu (2015) point out that cost flexibility is positively related to financial turnover, but negatively to absenteeism as well as to redundancies. Cost flexibility is one way of dealing with pressure due to competition and it has an impact on being solvent (Whyman and Petrescu, 2015). Referring to Whyman and Petrescu (2015), if companies are performing well, they do not need to cut/freeze costs. Moreover, profit-related pay leads to fewer redundancies but higher financial turnover due to more motivated employees. The counterpart shows that absenteeism and redundancies are high when cutting/freezing pay or bonuses. Therefore, a relationship between cost flexibility and SME performance indicators is established in the conceptual framework as well, again following the flexibility firm theory (Chatterjee, Chaudhuri and Vrontis, 2022; Rodgers, 1992).

2.3.3.1.3 HR commitment practices

Within the presented model, employees' support as well as employees' involvement form the higher order construct HR commitment practices. HR commitment practices are an expression of the employers' commitment to the employees (Martínez-Sánchez, Pérez-Pérez et al., 2008). It can be understood as an investment to tie employees to a company (Collins, C. J. and Smith, 2006; Tsui et al., 1997). Moreover, HR commitment practices (sometimes also called high-commitment HR practices) have the power to (de)motivate employees as well as to affect their commitment (McClean and Collins, 2011; Whitener, 2001). This leads to an environment in which companies invest in employees (McClean and Collins, 2011). These practices aim at increasing productivity and effectiveness, based on employees that identify with and work hard for the company's goals (Arthur, 1994; Wood and de Menezes, 1998). Therefore, greater financial performance, effectiveness as well as productivity are outcomes of HR commitment practices (Arthur, 1994; Ichniowski and Shaw, 1997; Wood and de Menezes, 1998). Moreover, employees are more willing to tolerate flexibility moves (Iverson, 1996). Finally, more WFPs could be used, as HR commitment practices are also fostering the trust of employees in a company (Martínez-Sánchez, Pérez-Pérez et al., 2008). A positive relationship between HR commitment practices as well as firm performance has been found in earlier research (Chen et al., 2017; Huselid, 1995; Latorre et al., 2016; Youndt et al., 1996) as well as an association between HR commitment practices and telework (Martínez-Sánchez, Pérez-Pérez et al., 2008). This also indicates a (positive) relationship between HR commitment practices and internal numerical flexibility because a company literally commits itself to its employees despite where and when they are working.

2.3.3.2 Team level

2.3.3.2.1 Transformational leadership

Burns (1978) firstly conceptualized transformational and transactional leadership and described transactional leadership as a change of transactions (e.g., remuneration as an exchange for performance). Bass (1985) as well as Bass and Avolio (1995) further developed the transformational leadership. This leadership style (which is overlapping with charismatic behaviors) focuses on the change of “basic values, beliefs, and attitudes of followers so that they are willing to perform beyond the minimum levels specified by the organisation” (Podsakoff et al., 1990, p. 108). The definition of transformational leaders by Bass (1985, p. 25) refers to “someone who raised their awareness about issues of consequence, shifted them to higher-level needs, influenced them to transcend their own self-interests for the good of the group or organization, and to work harder than they originally had expected they would”. The reason for this behavior is that employees (or followers) feel respect and trust towards their leader (Yukl, 1989). Furthermore, a transformational leader motivates and inspires followers and builds a morale which leads teams to succeeding in reaching goals (Howell and Avolio, 1993). Many earlier studies developed frameworks and tested them by focusing on the in-role performance, although the extra-role performance is the most important aspect of transformational leadership (Graham, 1988), as it is about lifting “ordinary people to extraordinary heights” (Boal and Bryson, 1988, p. 11). So, transformational leadership improves follower’s satisfaction and work attitude (Podsakoff et al., 1990). Meta-analyses exist that confirm positive associations between the transformative leadership of leaders and subordinates’ performance (Lowe et al., 1996). Moreover, transformational leadership has been studied in a variety of settings like business (Howell and Avolio, 1993), education (Koh et al., 1995), sports (Charbonneau et al., 2001), military (Hardy et al., 2010) and public sector (Rafferty and Griffin, 2004).

While the nature of transformational leadership lies in the fact that such leaders behave in ways which result in employees exceeding expectations (Bass, 1985), transactional leadership focuses on monitoring and controlling their contractual performance and output defined objectives (Antonakis et al., 2003). So, the amount to which a leader offers rewards for the performance of a follower (or employee) in exchange represents transactional leadership (Podsakoff et al., 1990). The majority of research on transformational leadership concentrates on its impact on organizational as well as individual performance (Ramsey et al., 2017). So, “charismatic/transformational leadership is the dominant conceptualization of leadership in organizational behavior” (Judge et al., 2008, p. 335).

According to Bass (1985) transformational leadership has four major dimensions, also called the four I's: idealized influence, individualized consideration, inspirational motivation and intellectual stimulation. Out of these four components, different measurement models have been developed like the Multifactor Leadership Questionnaire (MLQ) by Bass (1985) as well as Bass and Avolio (1995) as well as the Transformational Leadership Inventory by Podsakoff et al. (1990). As the MLQ has high intercorrelations, the factor structure of the measuring instrument is often doubted and often no replication of the theoretical factor structure could be achieved (Bycio et al., 1995; Tejeda et al., 2001).

Podsakoff et al. (1990) developed the Transformational Leadership Inventory (TLI) based on the literature in order to outperform the before-mentioned issues of the MLQ and identified six relevant elements of transformational leadership as well as one construct measuring transactional leadership. These seven key behaviors are explained in table 2.5.

Table 2.5: Key behaviors of transformational leadership

Own table, based on Podsakoff et al. (1990, pp. 112-113)

| Key behaviors | Short explanation |
|---|---|
| Identifying and articulating a vision (five items) | Leadership behavior aimed both at identifying opportunities for his or her organization and to develop, articulate and inspire others with his or her future vision |
| Providing an appropriate model (three items) | Behavior of the supervisor who is a role model for the employees (agreeing with the values of the supervisor). |
| Fostering the acceptance of group goals (four items) | The behavior of the leader was aimed at encouraging cooperation between employees and encouraging them to work to achieve a common objective. |
| High performance expectations (three items) | Behavior that reflects the leader's aspirations for high performance, quality and/or excellence from the followers. |
| Providing individualized support (four items) | Leader behavior that shows respect for followers and cares about their personal needs and feelings. |

| | |
|--|---|
| Intellectual stimulation (four items) | Conduct of the leader challenging the followers to review several of their beliefs on their work and think about how it can be carried out. |
| Contingent reward (transactional leadership) (five items) | The amount to which a leader offers rewards for the performance of a follower in exchange represents transactional leadership. |

The TLI was used in the leadership literature for a variety of studies (e.g., Gundersen et al., 2012; Ramsey et al., 2017; Schwepker and Good, 2010). The literature discusses the reliability of scales that work with self-reported data (Avolio et al., 1991). Although there are some authors stating that self-reported leadership behavior does not provide accurate predictions, there are others pointing out the opposite (Atwater and Yammarino, 1992; Bass and Yammarino, 1991; Kim and Yukl, 1995). Ostroff et al. (2004) point out that self-ratings and ratings of others are more agreeing, the more educated the raters are because “those with more education may be more likely to use feedback and process information from others in such a way that their self-ratings are more closely aligned with ratings from others” (Ostroff et al., 2004, p. 338). In recent literature, there are studies using self-reported data concerning leadership (e.g., Ramsey et al., 2017; Sesboué and Tolstosheeva, 2016).

The aspect of leadership is missing in the models presented by Martínez-Sánchez, Pérez-Pérez et al. (2008) as well as by Whyman and Petrescu (2015), although there are existing studies pointing out a relationship between transformational leadership and internal numerical flexibility (management by exception passive has no direct effect on numerical flexibility) (Mesu et al., 2013) and between leadership and performance (Ibrahim, 2015; Van Wart et al., 2019). This indicates a relationship to the aforementioned internal numerical flexibility construct as a mediating construct between the relationship from transformational leadership and the SME performance indicators. Leaders need to set the foundation by their leadership style for working flexibly. So, if leaders are role models and also work flexibly, employees will probably follow. Moreover, a “visionary leader engenders the feeling that people are part of an important mission, this might inspire them to spend some extra time finishing a job or spur them to stand in for an ill colleague” (Mesu et al., 2013, p. 123). From a negative perspective, transactional leadership also leads to more internal numerical flexibility, but only because employees flee from their managers, which is not in line with the modern and supportive approach to leadership and the commitment of employees in companies (Chatterjee, Chaudhuri and Vrontis, 2022; Mesu et al., 2013). So, a bad leadership style in these

cases makes employees feel that they are being forced to be available all the time (Mesu et al., 2013). Therefore, focusing on a commitment and performance-enhancing leadership style, transformational leadership is understood as being a requirement for working flexibly (Mesu et al., 2013).

In addition, a relationship between external numerical flexibility and the SME performance indicators is expected to be moderated by transformational leadership as indicated by Connelly and Gallagher (2004). It is expected that relations between transformational leadership and internal numerical flexibility will be established since Martínez-Sánchez, Pérez-Pérez et al. (2008) as well as Whyman and Petrescu (2015) both discuss this.

Leadership nowadays also uses ICT which relates to the concept of virtual leadership, operationalized by Ibrahim (2015) through four items, namely online interaction, online meeting, electronic file sharing and planner sharing (alpha values are above .715, underlining the suitability). The operationalization by Ibrahim (2015) is interpreted rather as a functional understanding of leadership. In addition, email or mobile phone are possible ways to communicate with others (Coenen and Kok, 2014; Franssila, 2013; Lal and Dwivedi, 2009; Taskin and Edwards, 2007) and virtual networks can be installed (Kingma, 2016; Taskin and Edwards, 2007). Coenen and Kok (2014) say that people communicate with one another using email, chat, presentations/documents that are exchanged or stored, and telephone. Since this study is about WFPs, the before-mentioned aspects will be used to measure if the functional usage of various media moderates the relationship between transformational leadership and internal numerical flexibility.

2.3.3.2.2 Intra-team communication

As uncovered by the systematic literature review, intra-team communication (e.g., via virtual networks) seems to be a way to prevent isolation among employees (Kingma, 2016; Lal and Dwivedi, 2009; Pratt, 1984; Taskin and Edwards, 2007). It can be defined as an information exchange, via (non)verbal channels (e.g., email) of two or more team members (Marlow et al., 2018; Mesmer-Magnus et al., 2011). In addition, virtual communication represents a possible way of communication between co-workers (Nordbäck et al., 2017), but communication of virtual teams have a weaker association with team performance due to non-face-to-face communication (Marlow et al., 2018). If teams are hybrid (they meet in person and virtually), the relationship between team communication and team performance is comparable to teams that meet in person because employees can use virtual communication tools for problem-solving, although they do not have to do so. (Marlow et al., 2018). Communication and performance are associated; therefore, it is important to distribute knowledge in a

manageable manner (Marlow et al., 2018). Moreover, team communication is a critical aspect of generating team performance since high quality communication enables members of the team to acquire relevant information needed to complete the task, while avoiding confusion (Marlow et al., 2018). Referring to Nordbäck et al. (2017), employees have the feeling that only staff members with leadership status are allowed to work flexibly (in this case: telework), which results from a non-supportive culture. In contrast to this, other companies have employees that inform each other about constraints regarding time and space. They plan meetings, which is a benefit for employees who are not working in the company's office, and they respond to the needs of others. According to Baruch (2000), a specific culture is needed within a company to allow workplace flexibility (telework).

To sum this up, quality of communication has a significantly stronger association with team performance than communication frequency (Marlow et al., 2018) and "coworker supportiveness was perceived to be important" so that every employee feels comfortable when working flexibly and envy does not arise (Nordbäck et al., 2017, p. 406). Egalitarianism is a foundation of supportiveness so that people feel as if they are equal, which leads to easier communication (Rubin and Martin, 1994). Regarding the above-mentioned example where employees have the feeling that only leaders have access to WFPs, the communication is non-supportive.

Research on communication styles show that through lexical research, which encompasses multiple phases, seven dimensions of communication styles were found (de Vries et al., 2009). These seven interpersonal scales create PRESENT as an acronym which stands "for preciseness, reflectiveness, expressiveness, supportiveness, emotionality, niceness, and threateningness" (de Vries et al., 2009, p. 178). The individual level presents different settings where communication is important, for instance if a relationship between partners is satisfying (Butler and Wampler, 1999), or if anyone is considered a leader (Awamleh and Gardner, 1999), or if cross-cultural communication succeeds (Brew and Cairns, 2004). Kuria (2019) points out that a communication style of a leader has an impact on the work outcome of both employees and leaders. Communication style is defined by de Vries et al. (2009, p. 179) as "the characteristic way a person sends verbal, paraverbal, and nonverbal signals in social interactions denoting (a) who he or she is or wants to (appear to) be, (b) how he or she tends to relate to people with whom he or she interacts, and (c) in what way his or her messages should usually be interpreted". De Vries et al. (2009) point out that their definition focuses on interpersonal, not intrapersonal, communication which omits, for instance, merely cognitive understandings of other people's expressions or emotional states in

response to these expressions (in contrast to Gudykunst et al. (1996) whose scales focus more on affects/cognitions in association with communication, but not of communication behavior (de Vries et al., 2009)). For this conceptual framework, therefore, a supportive intra-team communication is required since supportiveness of leaders and co-workers is crucial for working flexibly (Nordbäck et al., 2017).

Ibrahim et al. (2015) indicate that virtual leadership is related to job performance mediated by intra-team communication, as leadership affects the communication within organizations. Moreover, Marlow et al. (2018) point out a relationship between high quality of communication and performance. Therefore, the leadership scale and intra-team communication (group communication styles) with its underlying relationships between leadership and performance mediated by intra-team communication have been included in the initial conceptual framework. In addition, intra-team communication is positively linked to trust, as “trust is based on the expectation that others will behave as expected” (Jarvenpaa et al., 1998, p. 31), so trust can be established due to communication (a more detailed discussion follows in the next chapter).

2.3.3.2.3 Trust

If an organizational culture is not supporting WFPs, employees feel “a lack of trust”, e.g., if it is assumed that telework is to be equated with holidays (Nordbäck et al., 2017, p. 404). So, managers should trust their employees that they behave in the desired way because if they do not, these employees may distrust co-workers (Nordbäck et al., 2017). According to Nordbäck et al. (2017, p. 403), “supervisors commonly shared this view of mutual trust”. Therefore, a positive relationship between trust and internal numerical flexibility is expected.

If teams are virtual, trust is even more critical as social control is lacking and as there is less face-to-face contact than in teams that are not geographically dispersed, so it is harder to maintain trust (Cascio, 2000; Jarvenpaa et al., 1998). Referring to Jarvenpaa and Leidner (1999, p. 809) trust is founded on “personal relationships and past or future memberships in common social networks that define the shared norms of obligation and responsibility”. Moreover, “trust is the glue of the global workspace – and technology doesn't do much to create relationships” (O'Hara-Devereaux and Johansen, 1994, pp. 243-244). This is supported by several studies indicating that trust declines if vocal and visual cues are no longer present, e.g., in computer-mediated communication which is text-based (Bos et al., 2002; Rocco, 1998). “Trust is critical in a virtual team because traditional social control based on authority gives way to self-direction and self-control” (Cascio, 2000, p. 84). As a result of this, some kind of control is needed, like supervision (Jarvenpaa et al., 1998). Therefore, a

positive relationship between intra-team communication and trust is incorporated in the conceptual framework. Svensson (2012) as well as Voudouris (2017) have identified that trust declines when the degree of external numerical flexibility is high since this includes people that do not belong to the core workforce, i.e., are not employed by that company.

Trust can be studied through two different perspectives – the social or the rational perspective (Jarvenpaa et al., 1998). The latter one focuses on self-interest and the fact that transaction costs decline as trust inclines because self-protection is not as necessary (Jarvenpaa et al., 1998; Tyler and Kramer, 1996). Moreover, the presence of trust empowers individuals to risk-taking (Jarvenpaa et al., 1998). From the social perspective, trust is a moral obligation (Jarvenpaa et al., 1998). Therefore, people help other people in order to act morally fair/reasonable (Tyler and Kramer, 1996). So, the rational perspective allows researchers to study trust, for instance, as institutional phenomena (e.g., Sitkin and Roth, 1993), differences in individual personality (e.g., Stimpson and Maughan, 1978), cross-cultural topics (e.g., Farris et al., 1973), but mostly with regard to interpersonal relations (e.g., Deutsch, 1958; Mayer et al., 1995). As the above-mentioned communication style is an interpersonal one, this study also uses an interpersonal understanding of trust. Mayer et al. (1995, p. 712) define trust as “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party”. Jarvenpaa et al. (1998, p. 31) summarize this definition as “trust is based on the expectation that others will behave as expected”.

The literature differentiates between trustors and trustees’ characteristics. According to Mayer et al. (1995), the willingness to trust is proposed as a stable factor within the party that influences the likelihood it trusts. Individuals vary in their willingness to trust. Inclination could be imagined as the overall readiness to trust other people. The propensity determines the trust placed in a trustee before data about certain parties is available. The characteristics of the trustee are perceived ability (be perceived competently within a certain area), benevolence (desire to do the trustor good beyond an egocentric motive for profit) as well as integrity (compliance with a number of guiding principles which make the trustee trustworthy and reliable) (Jarvenpaa et al., 1998; Mayer et al., 1995). This is more complex at a group level as there are multiple trustees and trustors (Jarvenpaa et al., 1998). Several studies identified that trust is a mediating construct between transformational leader behavior and organizational citizenship behavior (Braun et al., 2013; Jena et al., 2018; Podsakoff et al., 1990; Yukl, 1989). In addition, Crisp and Jarvenpaa (2013) highlight that trust affects

performance indicators in virtual settings. Therefore, the relationship between transformational leadership and trust is established in the conceptual framework as well. Moreover, trust is also associated with SME performance indicators (instead of organizational citizenship behavior).

2.3.3.3 Individual level

Especially on the individual level, the Job Demands-Resources Model, established from Bakker and Demerouti (2007) and Xanthopoulou et al. (2007), serves as a guiding model for integrating the downsides either as causes, i.e., something is caused by working flexibly (the demands) or effects (strains or individual performance indicators). In this regard, occupational, private and social downsides are subsumed under demands since these refer to social, physical or psychological costs in order to deal with them. Moreover, these demands increase strains like stress and reduced career development of employees. The classification of downsides (causes or effects) stems from the categorization made in figure 2.5. The presented relationships between demands (downsides) and strains, strains and performance indicators as well as between individual and organizational performance indicators are derived from existing research (Bakker and Demerouti, 2007; Busse et al., 2020; Mor Barak et al., 2006; Xanthopoulou et al., 2007).

In a narrower sense, (inter)personal aspects like social, psychological or physical belong to resources (Bakker and Demerouti, 2007; Xanthopoulou et al., 2007). Consequently, transformational leadership and intra-team communication enable communication as well as trust. Therefore, they are classified under resources, referring to the JD-R. They either facilitate (inter)personal and therefore social communication or (inter)personal, social, physical and psychological aspects, such as leadership of employees, based on social relationships. These resources are then being used in order to remedy the downsides of working flexibly, either as a moderator on the nexus between downsides and strains or as an independent variable influencing individual performance indicators of employees (Bakker and Demerouti, 2007; Xanthopoulou et al., 2007). On an individual level, employee motivation, satisfaction, loyalty and performance are subsumed under the term of individual performance (Guest, 1997; Jiang et al., 2012; Mor Barak et al., 2006; Ployhart et al., 2011; Tirrel and Winnen, 2018). Prior research (Bakker and Demerouti, 2007; Busse et al., 2020; Jiang et al., 2012; Mor Barak et al., 2006; Ployhart et al., 2011; Xanthopoulou et al., 2007) has already uncovered that individual employee motivation enhances individual employee performance. Moreover, more satisfied employees increase employee performance as well as loyalty (direct and mediated via performance). Finally, individual performance indicators affect organizational

performance. These relationships underline why it is important to take care of the demands and strains. Since these can only be remedied by resources which enhance motivation, these resources must be as highly developed as possible so downsides and strains are circumvented. That leads to higher individual and in the end higher organizational performance.

Although the individual level design is not in the focus of the next stages, it has been explained very briefly in order to visualize causes and effects on employee level and their links to organizational performance. The job demands typically deal on an individual level, i.e., affecting individual persons, with potential advantages and downsides of flexible work. Therefore, this has been implemented in the conceptual framework, has been discussed briefly and finally offers opportunities for further research.

2.3.3.4 Critical aspects/downsides of flexible workplaces

As pointed out in chapter 2.2.4.3 there are critical aspects/downsides (occupational, private, social and financial) regarding flexible workplaces. Since it is the desire to capture the big picture instead of some smaller aspects (in line with the research philosophy of critical realism), the identified downsides are incorporated into the initial conceptual framework. Therefore, the initial conceptual framework will cover valuable information on how the downsides influence organizational or individual performance. Now the linkage between the downsides and the initial conceptual framework will be presented, starting with occupational downsides.

Dealing with the employees' fear of not being promoted (Illegems et al., 2001; Mann et al., 2000; Maruyama and Tietze, 2012; Pratt, 1984; Teo et al., 1998; Tietze, 2002), the items which capture the issue of multiple career paths as well as making employees aware of opportunities for internal career development are included in the HR commitment practices construct founded on Martínez-Sánchez, Pérez-Pérez et al. (2008) and incorporated in this initial conceptual framework.

The internal numerical flexibility construct captures the opportunity to work in flexitime or part-time (Martínez-Sánchez, Pérez-Pérez et al., 2008; Whyman and Petrescu, 2015) which is linked to the downside of working more hours per week (Baruch, 2000; Beasley et al., 2001; Golden, 2006b; Mann et al., 2000; Maruyama et al., 2009; Taskin and Edwards, 2007). This could be limited via flexitime or part-time work, but a group comparison is not the aim of this study.

Furthermore, employees are scared of being less visible (Kurland and Cooper, 2002; Maruyama and Tietze, 2012) which is circumvented when employees are able to participate in decision-making processes and are allowed to suggest improvements (functional flexibility construct). Moreover, and due to this downside, the moderating construct ICT has been included into this construct which contains possibilities of communicating when people are at different locations (Coenen and Kok, 2014; Franssila, 2013; Kingma, 2016; Lal and Dwivedi, 2009; Taskin and Edwards, 2007). Therefore, both leaders and employees can get in touch with each other, underlining the moderating effect of ICT on the relationship between transformational leadership and internal numerical flexibility. Moreover, the moderating construct ICT (Coenen and Kok, 2014; Franssila, 2013; Kingma, 2016; Lal and Dwivedi, 2009; Taskin and Edwards, 2007) probably has the power to circumvent the issue of not being able to access required and relevant materials for the job (Teo et al., 1998) as the whole team communicates via ICT and stores the documents and records digitally. In addition, ICT moderates the relationship between intra-team communication and internal numerical flexibility because due to the use of ICT the communication is easier to implement, since alternatively, for example, letters would have to be written.

Furthermore, there is a discussion about employees working even though they are ill (Mann et al., 2000). To analyze absenteeism and presenteeism (being at work in spite of illness (Johns, 2010)), a longitudinal study design would be necessary to compare, for instance, differences in absenteeism rates over a longer time horizon which is possible since absenteeism is incorporated in the SME performance indicators (Huselid, 1995; Whyman and Petrescu, 2015).

Some employees may deal with declining satisfaction and loyalty because stress inclines (Baruch, 2000; Harris, 2003; Illegems et al., 2001; Mann et al., 2000). This should be circumvented by transformational leaders who get others committed to their vision, who develop a team spirit and attitude within the workforce, who care about employees' feelings and treat employees respectfully (Podsakoff et al., 1990; Ramsey et al., 2017).

Next, the private downsides will be associated with items of the initial conceptual framework. These downsides are difficult boundary management (Hartig et al., 2007; Kingma, 2016; Kossek et al., 2006; Lautsch et al., 2009; Sullivan and Lewis, 2001), family-to-work conflicts (Golden et al., 2006) and role conflicts (Maruyama et al., 2009; Tietze, 2002). Private downsides are included in the initial conceptual framework because a leader who is caring and considerate of employees' feelings follows the transformational leadership style (Podsakoff et al., 1990; Ramsey et al., 2017). Moreover, the internal numerical flexibility

construct contains the question whether family friendly practices are offered by the company. These two aspects could lead to fewer role and family-to-work conflicts. Furthermore, employers are asked to answer if employees may regulate their behavior on their own and if they may work autonomously (Martínez-Sánchez, Pérez-Pérez et al., 2008). So, the HR commitment practices construct may contribute to the point that employees can handle their boundaries/boundary management individually and autonomously without too many management guidelines.

Now, the social downsides are associated with the initial conceptual framework. Starting with the issue of employees feeling isolated (Baruch, 2000; Collins, 2005; Cooper and Kurland, 2002; Harris, 2003; Illegems and Verbeke, 2004; Kurland and Cooper, 2002; Lal and Dwivedi, 2009; Mann et al., 2000; Maruyama and Tietze, 2012; Teo et al., 1998; Tietze, 2002) which can be circumvented when employers take care of employees feelings via transformational leadership (Podsakoff et al., 1990; Ramsey et al., 2017) on the one hand. On the other, the potentially moderating ICT construct enables communication across different locations and locally dispersed employees (Coenen and Kok, 2014; Franssila, 2013; Kingma, 2016; Lal and Dwivedi, 2009; Taskin and Edwards, 2007). This applies equally to the issue of having less face-to-face contact with supervisors and colleagues (Coenen and Kok, 2014; Harris, 2003; Illegems and Verbeke, 2004; Illegems et al., 2001; Watad and Will, 2003).

Moreover, involvement in teamwork is reduced if ICT is not used appropriately because employees are working at different places (Illegems et al., 2001) and informal training declines as a consequence of a high degree of informal communication, so regular meetings are missing in which information is exchanged (Cooper and Kurland, 2002; Kurland and Cooper, 2002). This will be incorporated in the initial conceptual framework by involving employees in teamwork and through measuring employees' involvement in decisions affecting their jobs in functional flexibility (Whyman and Petrescu, 2015). In addition, transformational leaders encourage employees to work together in a team as team players with the necessary attitude/spirit working for the same goal (Podsakoff et al., 1990; Ramsey et al., 2017).

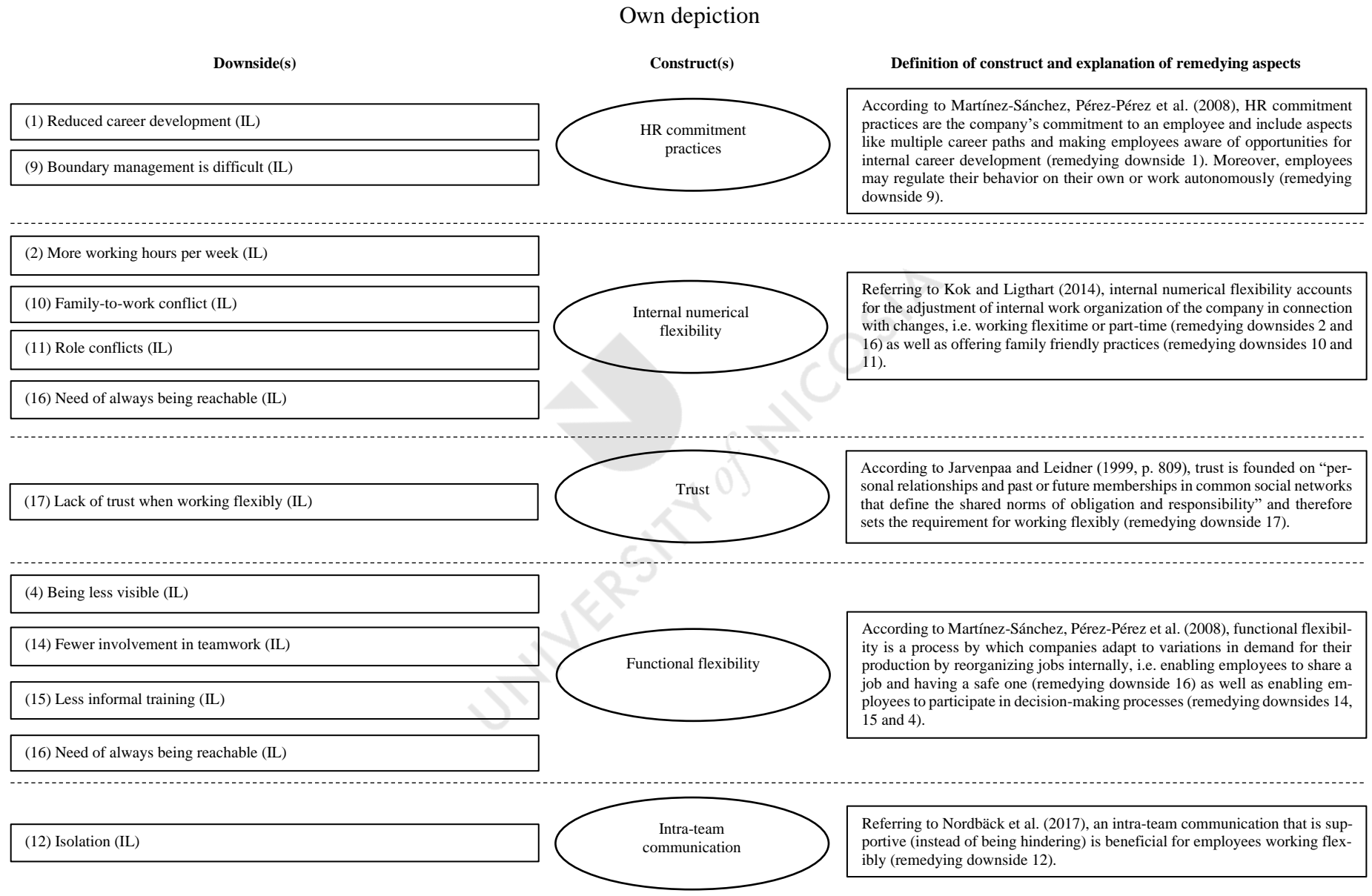
Employees feel the need to always be reachable (Kingma, 2016; Lal and Dwivedi, 2009; Tietze, 2002). This can be circumvented by communicating to employees that they have a secure job and by eventually letting them share a job (included in functional flexibility construct (Whyman and Petrescu, 2015)) as well as by offering part-time work and/or flexitime to employees (included in internal numerical flexibility construct (Martínez-Sánchez, Pérez-Pérez et al., 2008; Whyman and Petrescu, 2015)).

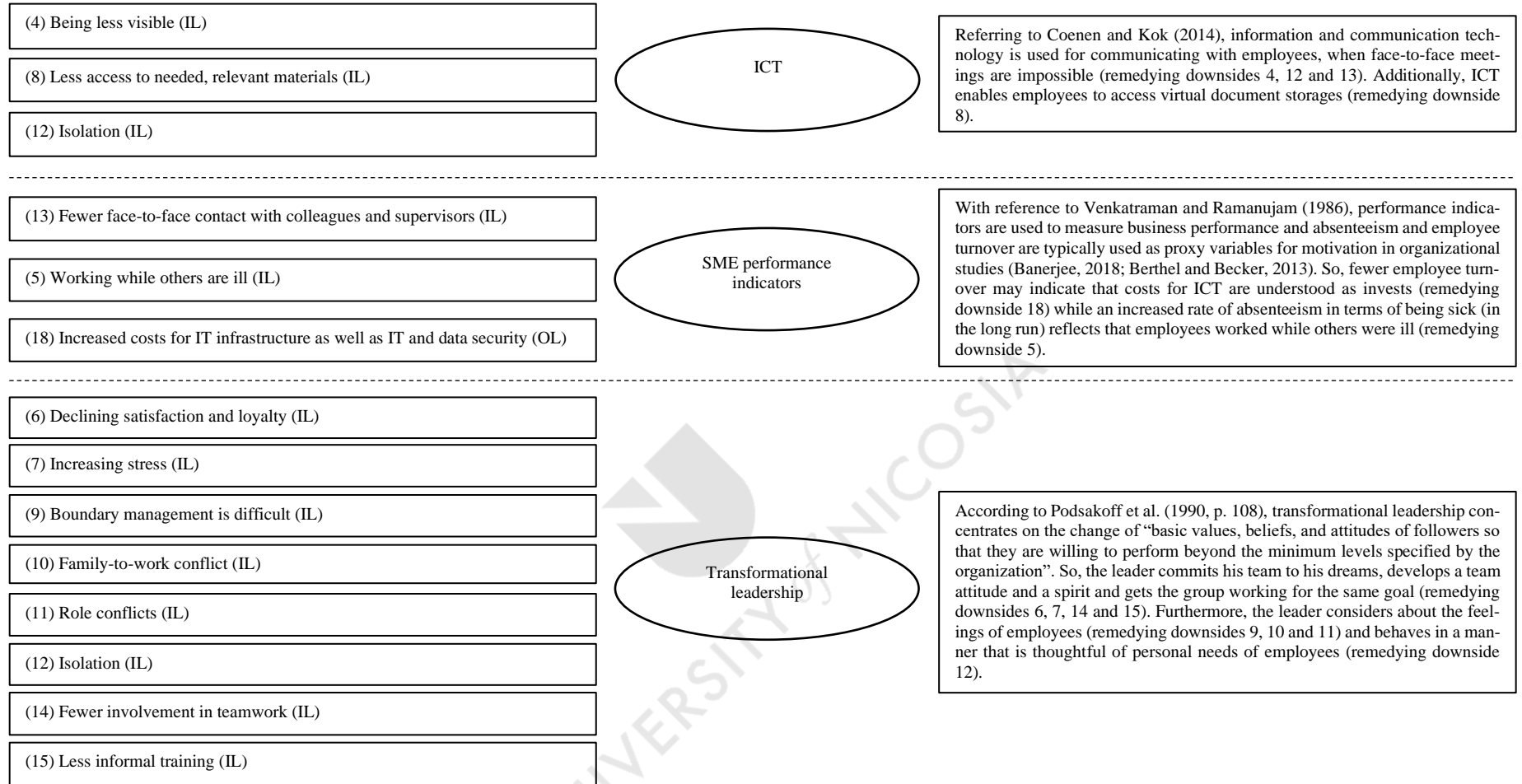
Another social downside is a lack of trust when working flexibly (Nordbäck et al., 2017; Taskin and Edwards, 2007). Due to this, Jarvenpaa and Leidner's (1999) trust construct has been included in the initial conceptual framework to explicitly measure trust through five items.

Financial downsides are now linked to the initial conceptual framework. If companies want to offer employees the freedom to work where and when they want to, this may be associated with costs for IT and data security as well as IT infrastructure (Harris, 2003; Illegems and Verbeke, 2004; Illegems et al., 2001; Mann et al., 2000; Sardeshmukh et al., 2012; Teo et al., 1998). This is a downside if employers have not already equipped employees with mobile devices. But in that case, it is more an investment in the future for gaining or keeping up a competitive advantage (Becker and Huselid, 1998; Katayama and Bennett, 1999; Muduli, 2013). This follows Barney's (1991) understanding of the resource-based view.

So, all downsides are integrated in the initial conceptual framework via constructs and its remedying aspects/items. Figure 2.7 summarizes this procedure.

Figure 2.7: Linking downsides to constructs of the initial conceptual framework and its remedying aspects





2.4 Conclusion

Within this chapter, a systematic literature review has been conducted in order to identify further research gaps and to present a holistic picture of which downsides may appear in companies when employees work flexibly. In addition, a narrative literature review has been conducted for understanding the specificity of SMEs, to identify a guiding SME model and to further underline the research gap.

2.4.1 Presentation of gaps

Based on the systematic as well as narrative literature review, several gaps were identified and elaborated in detail in chapter 2.2.5. These are subsumed under three major gaps. First, it is unclear how certain WFPs interrelate and how these are associated with leadership and company performance (Biron and van Veldhoven, 2016; Kingma, 2016; Martínez-Sánchez, Pérez-Pérez et al., 2008; Maruyama and Tietze, 2012; Masuda et al., 2017; Mesu et al., 2013; Whyman et al., 2015). Second, the role of ICT on working flexibly (like inferring the communication flows) needs to be specified by acknowledging the intensive developments in recent years (Golden and Veiga, 2008; Nordbäck et al., 2017; Martínez-Sánchez et al., 2007). Third, studies on WFPs in SMEs are rare, although these are an important part of the industry, especially in Germany. Consequently, there is a need for further knowledge on WFPs – probably in association with the aforementioned aspects – in SMEs (Mesu et al., 2013; Kotey, 2017; Whyman et al., 2015).

2.4.2 Conclusion of the chapter

The foundation for the initial conceptual framework was set, based on two guiding models. The conceptual framework was expanded by including the missing elements, as identified in the research gaps, along with the established downsides. Furthermore, the downsides have been evaluated and remedying aspects have been identified, so companies do not suffer from downsides but could be able to profit from the advantages of working flexibly, as pointed out in the flexibility firm theory (Chatterjee, Chaudhuri and Vrontis, 2022; Rodgers, 1992). The initial conceptual framework, developed in this chapter, will be studied and validated further in SMEs and described in the next chapters with a focus on WFPs, leadership, ICT and trust referring to the gaps.

In summary, the interim result of this chapter is threefold:

- (1) The systematic literature review is supplemented by a narrative one, which uncovered the gaps and sets the foundation for the initial conceptual framework

- (2) 18 downsides have been identified and categorized as occupational, social, private and financial downsides
- (3) The initial conceptual framework, reducing endogeneity as it is all-encompassing, is developed and presented, constituting a new contribution to theoretical knowledge.



CHAPTER 3 RESEARCH PHILOSOPHY, METHODOLOGY AND METHODS

3.0 Introduction

Within this chapter the research philosophy with its theoretical underpinnings and the research methodology with its approaches and methods will be defined and linked to this research project. Therefore, according to Crotty (1998) scientific paradigms (ontology and epistemology), methodology and methods will be discussed in this chapter. The discussion will follow the structure of the research onion by Saunders et al. (2016) and will move from the outer to the inner layers. Therefore, the research philosophy, purpose as well as methodological choice will now be discussed (Saunders et al., 2016). Deeper discussions on which technique and approach will be applied for generating and analyzing data follows in chapters 4 and 5.

3.1 Research philosophy

Research philosophy is defined as “a system of beliefs and assumptions about the development of knowledge” (Saunders et al., 2016, p. 124). Five major philosophical stances (positivism, critical realism, interpretivism, postmodernism and pragmatism) (Saunders et al., 2016) exist, but this chapter focuses on the researcher’s philosophy. Furthermore, one of these five stances will be chosen for this research study as a philosophical underpinning, which will be reasoned as well. Philosophical stances and methodology are related and it is important to use the terms clearly and to present the linkages (Crotty, 1998; Saunders et al., 2016). Referring to Crotty (1998) the methodology is the strategy that describes a priori which actions will be done according to which process. Moreover, the choice for the methods as well as the usage of them needs to be linked to the outcome desired by the researcher.

For going into more detail, research philosophy concerns ontological and epistemological assumptions (Crotty, 1998; Saunders et al., 2016) as well as axiological assumptions (Saunders et al., 2016).

Assumptions about how to see the world and the reality as well as where the reality arises (subjective or objective reality) concern ontology (Burrell and Morgan, 1979). Therefore, ontology is a subfield of philosophy that affects the nature and science of existence (Jankowicz, 2005; Raubal, 2001). Moreover, assumptions related to the nature of reality and the question about what the real world looks like forge the way of study and research (Porta and Keating, 2013; Saunders et al., 2016). There is a common understanding that questions dealing with reality and the nature of the world are the core rationale of ontology (Bates and Jenkins, 2007; David and Sutton, 2011; Jankowicz, 2005; Saunders et al., 2016). It also relates to social units and their nature (Bryman, 2016) and informs about the different

viewpoints of social scientists with respect to the world and its human beings (Morgan and Smircich, 1980).

The word epistemology is a combination of the two Greek words “episteme” (knowledge) and “logos” (theory or discourse) (Hillerbrand, 1988). Due to this, epistemology is defined as the “theory or model of knowledge” (Hillerbrand, 1988, p. 468). Several authors share the point of view that epistemology is equated to the theory of knowledge (Crotty, 1998; Cunliffe, 2011; Porta and Keating, 2013; Pritchard, 2014; Saunders et al., 2016; Southerland et al., 2001). This common definition shows the importance of knowledge in the field of epistemology. According to Hillerbrand (1988), three types of knowledge were identified by Aristotle – qualitative, performative and theoretical knowledge. Qualitative knowledge deals with the question of uniqueness and wants to behave ethically right in the end. Knowing how methods or procedures work appropriately is the performative knowledge – it deals with methods themselves. Through theoretical knowledge generalizations are possible due to the use of scientific methods. In contrast, Plato was concerned about knowledge as well as the true belief (Southerland et al., 2001). Plato stated that a reasoned true belief can be understood as a part of knowledge, if truth (reverberates reality), belief (individuals identify their proposition as truth) and evidence (defending one’s stance) are at play (Southerland et al., 2001). This is what dominated the orthodoxy of epistemology of the twentieth century in Anglo philosophy (Southerland et al., 2001).

Epistemology as the theory of knowledge is, according to Crotty (1998), KOMMA? not to be understood as a standalone theory, but as one which is embedded in a theoretical perspective as well as in methodology. This already shows that epistemology and methodology are not equal, although they sometimes blend (Cunliffe, 2011). Epistemology is broader and considers more issues with respect to philosophy (Cunliffe, 2011) which is also visualized as the outside layer of the research onion by Saunders et al. (2016), while methodology concerns about methods used for creating knowledge (Cunliffe, 2011), an inner layer of the research onion (Saunders et al., 2016). The nature of knowledge (Cunliffe, 2011; Nikitina and Furuoka, 2018) as well as the acquisition and origin of knowledge is still a discourse and philosophical debate (Nikitina and Furuoka, 2018), although Burrell and Morgan (1979) already defined epistemology in 1979. Due to them, the theory of knowledge (epistemology) deals with assumptions concerning knowledge, in specific what seems to be valid, legitimate and acceptable as well as how people transfer knowledge to others through communication (Burrell and Morgan, 1979). According to Hay (2006, p. 84) epistemology and ontology are interrelated as he states that “We cannot know what we are capable of knowing

(epistemology) until such time as we have settled on (a set of assumptions about) the nature of the context in which that knowledge must be acquired (ontology). Similarly, we cannot decide upon an appropriate set of strategies for interrogating political processes (methodology) until we have settled upon the limits of our capacity to acquire knowledge of such processes (epistemology) and, indeed, the nature of such processes themselves (ontology).” Moreover, Hay (2006) points out that ontology is the beginning and epistemology follows which then is followed by methodology, which again shows the association of these three.

Axiology – the philosophy/theory of values (Hiles, 2008) – concerns about ethics and values inside of research processes (Saunders et al., 2016). Axiology asks the question of how researchers deal with their own values as well as with the values of participants of research within a research process (Saunders et al., 2016) because these values are the leading reasons for all human action (Heron, 1996). Axios is the Greek word which means “to be strong/worthy” (this corresponds to the Latin word *valere*), which underlines that axiology is the theory of values (Hiles, 2008). Therefore, questions of goodness, truth, utility, are asked to identify what is desirable and valued (Biedenbach and Jacobsson, 2016; Greaves and Ord, 2017; Hiles, 2008). Within the research process, axiological skills need to be demonstrated by researchers (Heron, 1996; Hiles, 2008). What the research process looks like and how the final judgements are made, is based on specific philosophies which in the end articulate values (Heron, 1996). Through the research process, knowledge gets created which tries to (re)define the structure/order of the world, which relates to values (Hiles, 2008). To sum this up, the chosen research philosophy of a researcher also reflects one’s values (Heron, 1996).

This research study is framed by the research philosophy of critical realism, including ontology (critical realist), epistemology (critical realism) and axiology (critical realism). Experiences are explained by critical realism (in contrast to the philosophy of direct realism) as well as what somebody sees (Saunders et al., 2016). Critical realism has two different ways to comprehend the world, whereas the direct realist only has one way (Saunders et al., 2016). Sensations (also called experienced events or reality’s representations) are one way (Saunders et al., 2016). The other way is called reasoning backwards or retrodution which is a non-predictive approach but helps in order to comprehend the world (Reed, 2005). The main question of reasoning backwards is “what, if it existed, would account for this phenomenon?” (Reed, 2005, p. 1631). So, a methodology which is causal-explanatory can be set up (Reed, 2005). As researchers have a restricted access to reality (Zachariadis et al., 2013) or even to entire knowledge (Fleetwood, 2005), Bhaskar (2008; 1978) defined the layered ontology. Therefore, the ontology is differentiated in observed and experienced

events (phenomena, the empirical) first, in structures and mechanisms that generate events (the actual) second, and in long-lasting structures and mechanisms (the real) third (Bhaskar, 2008; 1978). Saunders et al. (2016) point out that it is important not just to try to explain observable organizational events but also their underlying mechanisms so that both the visible part and the big picture are described. David and Sutton (2011) strengthen Saunders et al. (2016) statement as it would not be enough to measure surface effects as a critical realist, because underlying mechanisms should also be discovered. This is the reason why qualitative and quantitative methods can be used in the research philosophy of critical realism (Reed, 2005; Saunders et al., 2016; Zachariadis et al., 2013). In addition, Saunders et al. (2016) point out that research may be influenced by prior experiences as well as the socio-cultural backgrounds and that researchers need to be aware of these influences in order to minimize biases and to stay as neutral as possible. According to Porta and Keating (2013, p. 24) “critical realist epistemology holds that there is a real material world but that our knowledge of it is often socially conditioned and subject to challenge and reinterpretation.” Moreover, mechanisms exist that regulate human affairs which can be both, unobservable and unobserved, but these cannot be neglected (Porta and Keating, 2013).

3.2 Research purpose and design

According to Creswell (2014, p. 123), the purpose statement “establishes the intent of the entire research study” and therefore outlines specifically, informatively as well as clearly the main idea and the methodology. In this respect, a clear distinction between purpose statement and research questions is necessary. In order to outline the purpose statement’s importance, it should be a single paragraph or sentence which makes it easier for other researchers to identify the research purpose statement (Creswell, 2014; Marshall and Rossman, 2016). Referring to Creswell (2014), the research purpose statements differ, if they are written for qualitative, quantitative or mixed methods studies. If a qualitative research study is desired, information on a single/central phenomenon which should be understood or explored need to be mentioned as well as its definition and who the participants are. To have an open inquiry, action verbs like understand, explore, develop, discover or examine are used. Moreover, the research site and limitations should be included in the purpose statement. In contrast, research purpose statements for quantitative studies include the identification of a conceptual framework, a model or a theory with its (in)dependent variables including moderating, mediating and/or control variables. The inquiry type (experimental research or survey), participants as well as the research site should be mentioned. This highlights the need for the researcher to be able to carry out the research according to the research plan (Marshall and

Rossmann, 2016). In the case of a mixed methods design, it is also a part of the research purpose statement to mention the type (e.g., exploratory sequential design, embedded sequential design), as stated by Creswell (2014). Moreover, it needs to be discussed why qualitative as well as quantitative research is required (Creswell, 2014). In addition, the research site, the data generation and analysis as well as the participants need to be included (Creswell, 2014).

The focus of the research project will be defined in a purpose statement, but it also informs about the type of study which will be undertaken: explanatory, exploratory or descriptive (Abutabenjeh and Jaradat, 2018). These three research purposes have been discussed and defined in the literature several times (Abutabenjeh and Jaradat, 2018; Babbie, 2010; Creswell, 2011; David and Sutton, 2011; Döring and Bortz, 2016; Kumar, 2014; Marshall and Rossmann, 2016; Miles et al., 2014; Saunders et al., 2016; Teddlie and Tashakkori, 2009). As they are well known, they will be described very briefly. Marshall and Rossmann (2016) equate the words describe, explain and explore with discover, develop and understand.

If a concrete outline of people, situations or events are the aim of the study, it is a descriptive one (Saunders et al., 2016). “The main purpose [...] is to describe what is prevalent with respect to the issue or problem under study” (Kumar, 2014, p. 13). Descriptive studies question the where, what, who and when of situations because there often is no a priori explanation available for the phenomenon, problem or situation of interest (David and Sutton, 2011; Kumar, 2014; Marshall and Rossmann, 2016). Therefore, descriptive studies help to understand as well as to interpret the provided information and they may derive problems as well as solutions (Abutabenjeh and Jaradat, 2018). One example is the study from Cohen et al. (2020), describing how 725 college students experienced the COVID-19 pandemic.

If the relationship of two or more aspects of a specific situation is to be clarified, it is an explanatory research (Kumar, 2014; Saunders et al., 2016). Moreover, relationships that are causal/plausible should be identified and – if possible – improvements should be made by researchers (David and Sutton, 2011; Kumar, 2014; Marshall and Rossmann, 2016; Miles et al., 2014; Saunders et al., 2016). Explanatory designs are therefore not just describing but explaining changes of values of dependent variables (Abutabenjeh and Jaradat, 2018). An example for an explanatory study is the study from Santos et al. (2021), examining the economic as well as social indicators in association with the total amount of COVID-19 tests performed.

When either a research interest, the phenomenon or the study's subject is new or poorly understood (Babbie, 2010; Marshall and Rossman, 2016), they will be explored in exploratory research in order to fulfill the curiosity of the researcher and his desire to better understand, to examine the possibility of a more comprehensive study and to devise the methods to be used in later studies (Babbie, 2010). Therefore, "an exploratory study is a valuable means to ask open questions to discover what is happening and gain insights about a topic of interest" (Saunders et al., 2016, p. 174). Measurement tools or procedures may also be redefined or developed within an exploratory study (Kumar, 2014). According to David and Sutton (2011), the situation needs to be descriptive assignment and additionally seeks to explain relationships between the described phenomena. The direction of research may change during the process, as the interest of study is new and usually starts with a broad view but narrows down during the research process (Saunders et al., 2016). An example for an exploratory study is conducted by Shahi et al. (2021) analyzing how fake news related to the COVID-19 pandemic were spread via the social network and microblogging service Twitter.

Although these three purposes of research are defined separately, as they have various impacts for different research design aspects, they can also be combined in a study (Babbie, 2010; Kumar, 2014; Marshall and Rossman, 2016; Saunders et al., 2016). According to Saunders et al. (2016), this can be realized by applying mixed methods within research design.

The purpose of this exploratory sequential mixed methods design is to better understand the relationships between workplace flexibility (practices) and performance, under consideration of technology, leadership and trust. Therefore, first, a systematic literature review, enhanced by a narrative, will be conducted to identify variables related to working flexibly for developing an initial conceptual framework of WFPs, transformational leadership, trust and intra-team communication on SME performance indicators. Second, a qualitative study will be conducted in which leaders of flexibly working SME employees will be interviewed in order to fill knowledge gaps in relation to the framework, so it is analyzable via further quantitative analysis. Third, and based on the insights of the literature review and interviews, a new scale for measuring technological requirements of virtual leadership (TRVL) will be developed following a multi-method procedure ending with a confirmatory factor analysis. Fourth, a quantitative study focusing on company/team leaders in German SMEs will analyze the interplay between WFPs, leadership, TRVL, trust, HR commitment practices and company performance via partial least squares structural equation modeling.

As the research design can be understood as a road map which describes how the study will be done (Kumar, 2014), it should be associated both with the research purpose and with the research objectives, as different objectives/purposes can result in different research designs (Kothari, 2004). According to Creswell (2014), it is not only the choice between a qualitative, quantitative or mixed study that matters, it is also the type of study. The research design is therefore the plan of how the research questions have to be answered, starting with the methodical choice (Saunders et al., 2016). The methodological choice can be divided into mono method and multiple methods, while mono method can again be divided into either a qualitative or a quantitative study (Saunders et al., 2016). The multiple methods can also be divided into subgroups: multi-method (then divided into multi-method quantitative or qualitative study) and mixed methods (divided into simple or complex mixed methods) (Saunders et al., 2016). The simplicity or complexity of mixed methods is differentiated by the level of complexity (if labeled as multiphase, fully integrated, hybrid or complex, it is simple mixed methods) (Schoonenboom and Johnson, 2017).

Since this study will be a mixed methods study, other potential methodological choices will not be discussed any further. Instead, the focus now moves to mixed methods. It means that qualitative and quantitative research will be combined (Bryman, 2016; Creswell, 2011; Fetter et al., 2013; Hennink et al., 2011; Marshall and Rossman, 2016; Miles et al., 2014; Plano Clark, 2019; Saunders et al., 2016; Teddlie and Tashakkori, 2009). Qualitative methods are used on research questions exploring why or how a phenomenon appears, generating a theory, or describing the nature of the experience of an individual, while quantitative methods for the treatment of research questions provide information on generalizability, relationships, causality or extent of effects (Fetter et al., 2013; Plano Clark, 2019). Therefore, it is possible to use different methods for knowledge generation (Plano Clark, 2019). Fetter and Freshwater (2015, p. 116) point out that using both (qualitative and quantitative research) is better or “more than the individual components” – so the power of both can be used (Kumar, 2014). But research principles that are established should not be violated and the research should be rigorous in both qualitative and quantitative research (Wisdom et al., 2012). According to Creswell (2014) and Creswell et al. (2008), there are three basic and three major research designs for mixed methods research. Referring to the (latest) literature, the three basic designs which are prototypical for mixed methods research are often discussed: convergent, exploratory sequential and explanatory sequential mixed methods research design (Alavi and Håbek, 2016; Bryman, 2016; Creswell, 2014; Fetter et al., 2013; Plano Clark, 2019; Saunders et al., 2016). Therefore, these three will be explained in short now.

Within the convergent mixed methods design (also called concurrent design), qualitative as well as quantitative data are generated, analyzed and compared to identify if the results are (dis)confirming (Creswell, 2014; Fetters et al., 2013; Plano Clark, 2019). The underlying assumption is that quantitative as well as qualitative data indeed allocate different information types, but the results should be equal (Creswell, 2014). Triangulation may be associated with this design (Bryman, 2016).

In sequential mixed designs, qualitative and quantitative research are done chronologically (Teddlie and Tashakkori, 2009). Therefore, the findings of the first research formulate the components for the next research (Mingers, 2001; Teddlie and Tashakkori, 2009).

On the one hand, a qualitative study can prepare a quantitative study (Bryman, 2016; Plano Clark, 2019). On the other, a quantitative study elaborates or explains a qualitative study (Bryman, 2016; Plano Clark, 2019). An explanatory sequential design defines the second of the two aforementioned alternatives, when an initial quantitative study is followed by a qualitative one which offers the possibility for researchers to deeply understand the mechanisms and nuances of the quantitative study's results (Bryman, 2016; Plano Clark, 2019; Teddlie and Tashakkori, 2009). Therefore, the two-phase research project intends to have data from qualitative research to better understand the quantitative results gained previously (Creswell, 2014). So, the data generation as well as the data analysis take place in two separate phases (Creswell, 2014; Ivankova et al., 2006).

In contrast, exploratory sequential design is described by a qualitative study followed by a quantitative study (Alavi and Håbek, 2016; Creswell, 2014; Fetters et al., 2013; Plano Clark, 2019; Teddlie and Tashakkori, 2009). So, the results of the qualitative research are tested or generalized in a quantitative study which is built on the qualitative results (Plano Clark, 2019). Although the quantitative research is informed by and built on the results of qualitative data (Creswell, 2014; Fetters et al., 2013; Onwuegbuzie et al., 2010), the overall aim is to achieve results that are generalizable (Alavi and Håbek, 2016). In exploratory sequential design quantitative findings are used to explain and interpret the qualitative findings (Alavi and Håbek, 2016; Jogulu and Pansiri, 2011). In addition, generated hypotheses may be examined during the quantitative phase (Bryman, 2016). So, "the intent of the strategy is to develop better measurements with specific samples of populations and to see if data from a few individuals (in qualitative phase) can be generalized to a large sample of a population (in quantitative phase)" (Creswell, 2014, p. 226).

In mixed methods, both phases can have an “equal status or [...] one dominant approach” (Jogulu and Pansiri, 2011, p. 690). The notations have been initially developed by Morse who stated that an arrow “→” represents sequential design and that uppercase abbreviations (i.e., QUAN or QUAL) represent dominant and lowercase abbreviations (i.e., quan or qual) represent the non-dominant part of the mixed methods design (Creswell, 2014; Morse, 1991). This is a qual → QUAN mixed methods study because the generalization of results is in the focus. Nevertheless, the quantitative study is informed by the qualitative results.

According to Easterby-Smith et al. (2015), there are several advantages as well as disadvantages related to mixed methods. The advantages are that the confidence, credibility and validity can be increased; deviation dimensions can be uncovered; different theories can be better integrated/synthesized; they are a critical testing ground for rival theories; and they are stimulating, inventive and creative methods. Moreover, a variety of views can be presented; they deliver improved (stronger) conclusions and exploratory and confirmatory research can be combined. The disadvantages are that it is difficult to repeat, there must be a relevance between the research questions and the research design, if false questions are asked mixed methods cannot be helpful, it is more resource intensive than the singular methods, their application demands a professional overall concept, the researcher must be trained in qualitative as well as quantitative methods and if one method is only used as a window dresser for the other method it is not useful.

3.3 Conclusion

According to Gephart (2004, pp. 455-456), “the relationship between theory and methodology is important. Researchers need to use methodologies that are consistent with the assumptions and aims of the theoretical view being expressed”. As already discussed before, the philosophy for this research is critical realism. The literature points out that a mixed methods research design is possible under the philosophy of critical realism (Bryman, 2016; Saunders et al., 2016; Zachariadis et al., 2013). Critical realism is seen as the most important (Mingers, 2004; Venkatesh et al., 2013) theoretical framework which is “capable of providing practical guidance for mixed methods (MM) research design” (Zachariadis et al., 2013, p. 856). As critical realism encompasses different methodological approaches stemming from various philosophical stances (Zachariadis et al., 2013), it “adopts a critical stance towards the necessity and validity of current social arrangements” (Mingers, 2001, p. 248). Neither are the existing paradigm assumptions used for the nominal value (Mingers, 2001). According to Venkatesh et al. (2013), critical realism is an optimal paradigm for research with mixed methods since it allows the presence of different kinds of knowledge objects – named,

conceptual, physical and social – with various ontological and epistemological meanings and characteristics. Therefore, it enables a combined use of several research methods in one research question to generate multiple insights into several research objects with different meanings and characteristics (Venkatesh et al., 2013). Therefore, in this research – as required by Gephart (2004) – the philosophical attitude is in line with the methodology.



CHAPTER 4 CASE STUDY

4.0 Introduction

At first, the research questions, aim and research objectives will be associated with the case study which underlines the relevance of qualitative research – as a part of mixed methods research design – at this point. After that, the methodological procedure of this research method will be described, while the qualitative research will be conducted (data generation) and analyzed (data analysis). Finally, the results of the qualitative research will be described and discussed. The results will then be incorporated in the initial conceptual framework leading to a new/revised conceptual framework which will be the foundation for the quantitative research (stage three). This stage will be written in the neutral person since this study follows the critical realist philosophy and not the interpretive philosophy (which would underline that the qualitative study will be written up in the first person using “I”) (Tracy, 2010).

4.1 Linking research questions, aim and research objectives to the case study

As presented in table 1.1, the grand design links research questions, research objectives, research methods and techniques as well as detailed research questions, hypotheses and stages. Following this grand design, the research questions RQ1a, RQ1b and RQ2 as well as the research objectives RO1 to RO4 are linked with the second stage and therefore with the case study. Derived from the literature and in line with the exploratory sequential mixed methods, three detailed research questions (DRQs) were identified which are in the focus of this qualitative research in order to create richer knowledge (Yin, 2012).

Since this study is conducted under the research philosophy of critical realism, causal detailed research questions begin with how or why in order to ask about particular mechanisms (Easton, 2010; Wynn and Williams, 2012). These DRQs highlight the relationships between transformational leadership, trust as well as internal numerical flexibility. In addition, information and communication technology is included as a possible moderating variable between transformational leadership and internal numerical flexibility. This moderator – as discussed by Ibrahim (2015) – shines a light on instruments used for communication between leaders and employees (followers).

One major aspect which is discussed in the literature is how to lead employees that work flexibly. This has already been discussed in detail in chapter 2.3.3.2.1. The essence is that transformational leadership seems to be an appropriate solution which is related to numerical flexibility (Mesu et al., 2013), although they did not provide any reasons based on in-depth interviews. Moreover, they analyzed only an excerpt – and therefore not all dimensions – of

transformational leadership behaviors in their study (Mesu et al., 2013). Because this construct includes the different workplaces as well as flexibility concerning time (flexitime and part-time) the first detailed research question deals with the relationship between transformational leadership and internal numerical flexibility. Boal and Bryson (1988, p. 11) highlight that transformational leadership is about lifting “ordinary people to extraordinary heights”. This is done by changing beliefs, attitudes and basic values of employees so they perform above the required minimum (Podsakoff et al., 1990). Due to this, a morale is built that motivates teams and leads them to success (Howell and Avolio, 1993). Moreover, this leadership style is the predominant conception of leading in organization behavior (Judge et al., 2008) that “dominates the leadership landscape” (Antonakis, 2012, p. 257). Referring to Purvanova and Bono (2009), transformational leadership is capable of dealing with computer-mediated communication, so no personal meetings are required. But no clear statement of how transformational leadership influences employees that work flexible could be identified – neither in the systematic nor in the narrative literature review, despite the fact that transformational leadership is the flagship (Ehrnrooth et al., 2020). Therefore, the following detailed research question is raised on how transformational leadership influences internal numerical flexibility from a theoretical and managerial perspective:

DRQ1: How does transformational leadership influence employees that work flexibly?

Moreover, trust is an important aspect in this research area since a trustful environment within companies needs to be established. Otherwise, a lack of trust may be counterproductive in cases of working flexibly (Nordbäck et al., 2017). It could be associated with (paid) days off which could result in a whole workforce that does not trust itself (Nordbäck et al., 2017). Trust is not easy to maintain when teams do not meet in presence and it is declining if visual or vocal guidance is missing (Bos et al., 2002; Cascio, 2000; Jarvenpaa et al., 1998; Rocco, 1998) because it is grounded on personal relations (Jarvenpaa and Leidner, 1999). Furthermore, trust was not part of the study from Mesu et al. (2013) although transformational leadership enhances trust (Braun et al., 2013; Jena et al., 2018; Podsakoff et al., 1990; Yukl, 1989). A clear understanding of how trust influences internal numerical flexibility – and therefore the opportunity to work flexibly (in time and place) – has not been identified. No study was identified which combines trust in this specific context with working flexibly or WFPs. As a consequence, the following DRQ2 is set up in order to create richer knowledge about this phenomenon (Yin, 2012).

DRQ2: How does trust influence employees that work flexibly?

The efficient and effective use of ICT (e.g., via the computer, (mobile) phone, virtual networks) is essential for successful (a)synchronous communication in flexible workplaces (Coenen and Kok, 2014; Franssila, 2013; Lal and Dwivedi, 2009; Men, 2014; Purvanova and Bono, 2009; Taskin and Edwards, 2007). As technology and, as a result, various communication tools advance (Men, 2014), it is essential to understand the way (non)verbal communication works between leaders and employees when working flexibly, e.g., interactive, supportive (Darics, 2020). So, the laptop and the connection to the internet are essential and can be viewed as a mobile office (Kingma, 2016). This seems to be important because then “third workspaces can be perceived as alternative work settings” (Kingma, 2016, p. 180). Men (2014) points out that transformational leaders are able to communicate mediated by technology (although they prefer personal communication) in large companies which underlines the necessity of implementing new technologies (f.i., webcams, video or audio messages), facilitating rich communication and the strengthening of relationships (Sheer, 2011). While ICT seems to be of great importance, the inclusion of ICT in the exploration of the leadership-trust nexus in combination with flexible working employees is missing in existing studies (Braun et al., 2013; Jena et al., 2018; Martínez-Sánchez, Pérez-Pérez et al., 2008; Mesu et al., 2013; Nordbäck et al., 2017; Whyman and Petrescu, 2015). Hence, it remains unclear how ICT affects transformational leadership for flexible workers, which results in the need for the third DRQ in order to gain a richer knowledge about this phenomenon (Yin, 2012).

DRQ3: How does the usage of ICT influence leadership and employees that work flexibly?

4.2 Methodological procedure of the qualitative case study

Case studies are used when an in-depth or deeper understanding in a specific real world context is desired (Yin, 2012). Case studies are common research methods in various field including business for contributing to knowledge concerning a specific phenomenon (Yin, 2014). Due to this, a case study is defined as “an empirical inquiry that investigates a contemporary phenomenon (the ‘case’) in depth and with its real-life context, especially when the boundaries between phenomenon and context may not be clearly evident” (Yin, 2014, p. 16). According to Matthews and Kostelis (2011, p. 303), a case study constitutes “an in-depth examination into a case – such as a person, organization, incident, or community – employing a wide variety of data collection methodology to understand the case”. Examples for cases are organizations, single persons, groups, change processes or events (Saunders et al., 2016). In addition, case studies take place in situations in the real world where more variables may be available, triangulation can be used (multiple sources), and the case study

may be guided through already existing theoretical recommendations (Yin, 2014). This follows the deductive logic – which is also possible when conducting case studies (Saunders et al., 2016; Yin, 2014) – “from the general to the particular, or an emphasis on a priori hypotheses (or theory)” (Tashakkori and Teddlie, 2008, p. 11) instead of the inductive logic (“from the particular to the general, or an emphasis on ‘grounded’ theory” (Tashakkori and Teddlie, 2008, p. 14). So, instead of using observations or findings for building theories, theories are used for understanding findings or observations in order to revise a theory (Bryman, 2016).

So, this study uses a qualitative case study as a part of mixed methods research as it is intended to – guided by prior knowledge – understand the phenomenon of research in its specific real world context. According to Saunders et al. (2016), alternative qualitative research methods for other purposes are ethnography (analyzing a certain group by being part of it for a timeframe), grounded theory (building theory by following a purely inductive logic), narrative inquiry (participants serve as storytellers about a specific event), action research (participatory approach by including the participants into the study) or archival as well as documentary research (studying existing documents). Going back to Abutabenjeh and Jaradat (2018) who point out that every method has its own strengths and weaknesses, Babbie (2010) underlines that due to this reason multiple methods are the best way because every method’s strength will be combined.

Referring to Yin (2014; 2012), four different styles of designs are possible for case studies, namely single-case (holistic), single-case (embedded), multiple-case (holistic) and multiple case (embedded). Single-case designs can be powerful when one case ($N = 1$) is unusual, critical, revelatory, longitudinal or common (DePoy and Gitlin, 2016; Yin, 2014). This is not the fact in this study (flexible work is possible in several companies). This study is designed as a holistic multiple-case study because analyzing various cases is done “to understand similarities and differences between the cases” (Baxter and Jack, 2008, p. 550). So, participants with different backgrounds and experiences (the cases) from different companies (various workplace contexts) are studied (DePoy and Gitlin, 2016). However, the workplace will not be segmented any further but rather understood as one workplace (DePoy and Gitlin, 2016). Based on the aforementioned reasons, this study constitutes a holistic multiple-case study. Results of multiple cases offer stronger results as statements are based on a deeper foundation of different empirical evidence (Eisenhardt and Graebner, 2007). Moreover, relationships as well as constructs are more precisely defined due to determination of precise definitions and appropriate levels of abstraction based on multiple cases (Eisenhardt

and Graebner, 2007). Therefore, different cases are used in this study because different points of view (it is currently unclear whether they are similar or contradictory) of various people in their different contexts will be examined. Finally, it is relevant to know whether the interviewee's statements are nearly equal so there is a literal or direct replication logic, or if they are contradictory so there is a theoretical replication (Yin, 2014; 2012). So, if cases duplicate or are close to the first (original) case, there is a literal replication logic, underlining that these replications are robust (Yin, 2014). This qualitative research is a holistic case study because it "is shaped by a thoroughly qualitative approach that relies on narrative, phenomenological descriptions" (Scholz and Tietje, 2002, p. 9).

According to the time horizon, two different ones are possible: cross-sectional (focused on a specific point of time, comparable to a snapshot) or longitudinal (covers a period of time, comparable to a diary) (Saunders et al., 2016). This study will be cross-sectional, as the actual situation of employers will be analyzed in order to use the information gathered in a follow-up quantitative study. Nevertheless, it is possible to repeat the analysis after a certain period of time, so that a longitudinal design is conceivable in principle.

4.2.1 Evaluation criteria concerned with data quality

According to Miles et al. (2014), it is important to explicitly provide information on how high-quality conclusions have been drawn. In line with the critical realist philosophy, five issues are discussed which go back to the quality criteria of Lincoln and Guba (1985), namely "(1) the objectivity/confirmability [...], (2) reliability/dependability/auditability, (3) internal validity/credibility/authenticity, (4) external validity/transferability/fittingness, and (5) utilization/application/action orientation" (Miles et al., 2014, p. 311).

Referring to Miles et al. (2014), the first of the five issues concerning standards of quality for conclusions is called objectivity/confirmability and deals with the issue that biases exist. In quantitative terminology it would be called external reliability. This quality criterion can be achieved via transparently describing the whole research process so that every single step or drawn conclusions is understandable. Lincoln and Guba (1985) require that the procedure and methods are recorded so detailed that an external person can audit it. Moreover, the conclusions are linked with the data, alternative conclusions or research streams have been taken into account and the data remains available for a reanalysis by others (Miles et al., 2014).

In this qualitative study the research procedure is presented transparently – especially in the Gioia table (cf. table 4.1) which visualizes the data analyses procedure. The procedure is

described in every detail so that an external audit is considered as possible. In addition, all conclusions will be drawn in strong association with the data, sometimes in vivo coding (using words or phrases of interviewee) will be used to underline the linkage. Furthermore, the researcher is well-aware of his own role (cf. chapter 4.2.2).

The second quality criterion is called reliability/dependability/auditability and deals with the question of whether the research process is robust over time and if it is consistent as well as with cross-researcher and cross-methods (Miles et al., 2014). Therefore, the main question is “have things been done with reasonable care?” (Miles et al., 2014, p. 312). So, clearly formulated research questions fit to the design of the study, the role of the researcher is described, findings are comparable to other participants or times or contexts, constructs and paradigms are clearly specified (reliability is related to theory) and data was generated over the entire range of participants, settings and times in line with research questions (Miles et al., 2014). Furthermore, all researchers in the field have the comparable data generation protocols and accounts are converging. Reviews of the intercoder agreement were carried out with reasonable results, where necessary, data was checked in relation to quality issues like biases and colleague or peer reviews are used (Miles et al., 2014).

In this study, reliability/dependability/auditability is achieved via purposive sampling leading to a reasonable sample which is needed with respect to the research questions and the role of the researcher is clearly described and considered (cf. chapter 4.2.5). The generated data will afterwards be compared to existing knowledge in the literature and due to the combination of qualitative and quantitative research (mixed methods) there is a methodological triangulation. For this study one researcher does the field work so that data will be generated and analyzed equally. Since it is the requirement that one researcher conducts the research on his own, the intra-coder reliability will be analyzed and reported. Intra-coder reliability means that a researcher repeats his coding procedure for a defined excerpt of the material or for the whole data after a specific period of time (e.g., four weeks after the first coding) to report a measurement for the stability of the analysis (Bewernick et al., 2013; Mayring, 2010). This study follows the conventional recommendation from Döring and Bortz (2016) to analyze ten to 20 percent of the data. For evaluating the intra-coder reliability, the coefficient of reliability (C.R.) will be used since this is “a widely used coefficient of reliability” (Holsti, 1969, p. 140). The formula calculates a percentage of agreement of coded data which leads to an easy to understand result which however tends to overestimate, representing the critics on this formula (Döring and Bortz, 2016). Nevertheless, Holsti’s coefficient of reliability has been used frequently (Holsti, 1969) so that it will be used in this study as well

because other reliability measures focus on inter-coder reliability. Referring to Holsti (1969), this formula contains the amount of coding decisions (M) the rater agrees on twice and the amount of coding decisions (N₁ and N₂) taken by the rater in the first and second time of coding:

Equation 4.1: Coefficient of reliability

Holsti (1969, p. 140)

$$C.R. = \frac{2M}{N_1 + N_2}$$

For this study, two of the twelve interview transcripts have been selected (interview 1 and interview 12, so an interview from the very beginning and an interview from the end of the coding procedure are included) to be coded again, representing 16.67 percent of the data. The initial codings (N₁) as well as the codings of the reliability assessment (N₂) and the total number of codings (M) have been included in the formula:

Equation 4.2: This study's coefficient of reliability

On calculation, based on Holsti (1969, p. 140)

$$C.R. = \frac{2 \cdot 72}{81 + 76} = .92$$

Since the result represents a percentage that can only be between zero and 100 percent, the result should be as close as possible to 100 percent (Döring and Bortz, 2016; Wirtz and Casper, 2002). Neuendorf (2002) suggests to reach a reliability of at least .8 which should suffice in most situations. However, a reliability greater than .9 can be constituted as acceptable. Kolb (2004) proposes achieving .9 as a threshold, meaning that 80 percent or 90 percent should be agreed on by the rater. For this study, a coefficient of reliability of .92 (equaling 92 percent of agreement) was achieved. Therefore, reliable results were generated since the thresholds of .8 and also of .9 have been reached, representing a stable analysis.

The next quality criterion, internal validity/credibility/authenticity, questions if the presented study makes sense and if it is credible towards readers as well as participants (Miles et al., 2014). Following the approach of rigorous research, the term validity is used although traditional researchers do not prefer it (Miles et al., 2014). According to Miles et al. (2014), aspects that should be considered are sensemaking, plausible and thick descriptions so the data is linked to constructs. Furthermore, triangulation is used, findings are presented clearly and in association with the detailed research questions whereby uncertainty has been eliminated and alternative explanations have been considered. Moreover, findings that have been

replicated should be highlighted, explanations that are offered are coherent or participants stated that conclusions are accurate. Finally, predictions should be reported in association with accuracy.

In this study, thick descriptions and sensemaking descriptions will be used in order to deeply describe the context and the rich content. Moreover, data/findings will be linked to constructs as often as possible, they will be presented clearly and systematically, member check will be used in order to draw accurate conclusions and any predictions will be explained as detailed as possible. Since the qualitative study seeks to better understand the findings from the systematic and narrative literature review, this can be understood as another data source which in the end meets the concept of triangulation (Matthews and Kostelis, 2011).

The next quality criterion is called external validity/transferability/fittingness and focuses on the impact of a study's results and whether they are transferable or do they fit in other contexts (Miles et al., 2014). Although there is a discussion about generalizing results of qualitative research, the focus should be on a mindful interpretation of the results, which are summarized (Miles et al., 2014). So, it is about convincing results which could have a meaning to others (Miles et al., 2014). Referring to Miles et al. (2014), it is important to describe the sample with its characteristics and limitations in depth. Thick descriptions should be accessible so readers can use them in their own surroundings. So, findings should be discussed in linkage to theory and suggestions in which settings these findings could be evaluated should be presented.

In this study, thick descriptions will be used, the sample will be described in detail (descriptive statistics) and the results will be discussed in association with prior theory, so that readers can internalize the qualitative research.

The last quality criterion is called utilization/application/action orientation and focuses on the benefits of participants and researchers in qualitative studies (Miles et al., 2014). Referring to Lincoln and Guba (1985) as well as Miles et al. (2014), it is important to circumvent ethical issues, make findings accessible to interested people and ensure that the findings are of high quality, so readers are stimulated intellectually while reading. The results should also provide usable insights into problems. People who used the findings felt empowered and developed further.

With reference to this study, no ethical concerns have been raised and the study has passed an ethical evaluation and received an ethical clearance certificate. This is based on only interviewing adults who participated voluntarily without any kind of suffering due to being

part of this study. Moreover, it is desired to publish the results of the study, which hopefully are of high quality and make an impact, so the results are accessible to others.

4.2.2 The role of the researcher as an interviewer

As a researcher in qualitative research, sincerity is important in order to be self-reflective, honest, vulnerable, and transparent (Tracy, 2010). In this context “sincerity means that the research is marked by honesty and transparency about the researcher’s biases, goals, and foibles as well as about how these played a role in the methods, joys, and mistakes of the research” (Tracy, 2010, p. 841). So, being self-reflective means that researchers are aware of their own strengths and weaknesses on the one hand and to be authentic and honest with the audience, the research and oneself on the other (Tracy, 2010). Therefore, self-reflexivity is a practice that moves along the whole qualitative research because researchers consider which knowledge is available and which is lacking (Tracy, 2010). Referring to Tracy (2010), self-reflective researchers question their own preferences or opinions and request participants to provide feedback.

According to Tracy (2010), transparency is another important aspect of sincerity which means to be honest on the process of research (e.g., how the researcher fitted in with the setting, the degree of involvement and immersion, the practice of field notes and the level of transcription detail). After every interview field notes will be taken in order to improve the interview guide. Field notes will be taken with pen and paper, so they can be written up right after or even during the interview.

To sum up, sincere researchers are friendly, approachable and “they consider not only their own needs but also those of their participants, readers, coauthors and potential audiences. Sincere researchers are empathetic, kind, self-aware, and self-deprecating” (Tracy, 2010, p. 842).

The involvement of a qualitative researcher is also shown in the differentiation of the emic and etic since qualitative researchers present their own “set of meanings of the same events” (Yin, 2011, p. 11). Emic perspective tries to understand the native meanings of the participants in real world events. In comparison, etic view attempts to represent the identical set of real world events, however from an external perspective (the point of view of the researcher) (Yin, 2011). Due to this, it is important to know that researchers cannot get around their own research lenses in presenting reality leading to the point that there are several interpretations possible, although “as much as possible is done to prevent a researcher from inadvertently

imposing her or his own (etic) interpretation onto a participant's (emic) interpretation" (Yin, 2011, p. 12).

Kvale (1996) presents ten criteria of being a successful interviewer. These are: being knowledgeable, structuring, clear, gentle, sensitive, open, steering, critical, being able to remember what was said (remembering) and to interpret the statements (interpreting) (Kvale, 1996). Moreover, Alvesson (2003) states that the researcher guides the responses of participants by gestures, or the terms used.

So, there are several aspects a researcher has to keep in mind. For this qualitative study, the researcher is aware that his actions may influence the reactions of participants. In order to be as self-reflective as possible, the researcher introduces himself and presents the aim of the study at the beginning of each interview. As a result of this, the researcher maintains honesty, authenticity and transparency. Moreover, the researcher tries to follow Kvale's (1996) criteria of being a successful interviewer and not to guide the responses of participants too much. The researcher will present thick descriptions from in-depth data to offer as much transparency and objectivity as possible, which adds to the researcher's credibility (Tracy, 2010).

4.2.3 Semi-structured interviews

In this qualitative study, the research technique semi-structured expert interviews will be used. Interviews "are a powerful data collection strategy because they use one-to-one interaction" (Teddle and Tashakkori, 2009, p. 229). Alternatively (not one to one), it is also possible to conduct interviews as one to many, for instance group interviews (Saunders et al., 2016). Through interviews, it is possible to access attitudes and experiences of individuals and the researcher has direct contact to the person and his/her reality (Peräkylä and Ruusuvuori, 2011). Interviews are focused on the main area of a researcher's interest (Peräkylä and Ruusuvuori, 2011). Categories of interviews are structured, semi-structured, unstructured or in-depth, while others differentiate between standard (with a set of questions) and non-standard interviews (without a set of questions) (Saunders et al., 2016). Since qualitative research mostly is based on interviews (Peräkylä and Ruusuvuori, 2011), semi-structured interviews will be used to generate data, meaning that one person (interviewer) asks another person (interviewee) questions (Teddle and Tashakkori, 2009).

Semi-structured interviews are defined as a "wide-ranging category of interview in which the interviewer commences with a set of interview themes but is prepared to vary the order in which questions are asked and to ask new questions the context of the research situation"

(Saunders et al., 2016, p. 727). Therefore, it is possible to understand what happens in which context (exploratory research) but also to describe why variables are related to each other (explanatory research) (Saunders et al., 2016). The interviews in this study will mainly be exploratory interviews as it is desired to understand what happens when employees work from elsewhere. But they will also be to some extent explanatory interviews because the relationships between some variables are in the focus because the initial conceptual framework will be reworked after the qualitative study. Semi-structured interviews can be advantageous in cases of establishing personal contacts and it is more likely to be completed by managers than questionnaires, because they do not have to write up anything (Saunders et al., 2016). Moreover, interviewers can be more trustworthy than sending a questionnaire and especially if questions are open ended and/or complex and their logic and order may be adjusted, semi-structured interviews appear to be beneficial (Bryman, 2016; Saunders et al., 2016).

So, the researcher has listed themes or key questions which cover a specific phenomenon, but they may vary in different interviews because it is not a structured interview (Saunders et al., 2016). The direction of the interview can be rearranged flexibly and questions can be reordered, added or even deleted depending on the specific situation (Bryman, 2016; Saunders et al., 2016). So, through the use of open-ended questions, interviewees were encouraged to explain their experiences in-depth so that novel concepts can arise (Dearnley, 2005). Therefore, opinions and perceptions with reference to complex and occasionally sensitive issues can be discussed (Barriball and While, 1994).

According to Saunders et al. (2016) and Yin (2014) it is a prerequisite to be well-informed about the research topic which comes in line with a deductive qualitative case study. In this study, this point has been achieved via a systematic literature review. Moreover, interviewers should be informed about the organization involved in the interviews, which helps to underline the researcher's credibility (Saunders et al., 2016). In addition, cultural aspects should be considered, if necessary (Saunders et al., 2016). Furthermore, the topics of the interview or even the interview questions should be forwarded to the interviewee in advance, if they require these (Saunders et al., 2016). This can help to improve validity and reliability of the results because the interviewee knows about the focus of the interview (Saunders et al., 2016). It is also important to choose a location that is free of disturbances and where participants as well as the researcher feel safe and comfortable (Dearnley, 2005; Saunders et al., 2016). The setting should also be quiet so the audio recording is of high quality (Dearnley, 2005; Saunders et al., 2016). In addition, the researcher should pay attention to his clothing,

so that no hierarchy is formed or reinforced, which could influence the results (Dearnley, 2005).

4.2.4 Development of an interview guide

Within semi-structured interviews an interview guide is a list that structures questions (Bryman, 2016). So, existing knowledge was used to design a means of generating data (Kallio et al., 2016). The interview guide directs the interview to the research topic (Åstedt-Kurki and Heikkinen, 1994; Cridland et al., 2015; Kallio et al., 2016). As already described, an interview guide is a loose and flexible form of an interview in which dialogues are allowed, questions can be reordered and a simple moving from one question to another is possible (Åstedt-Kurki and Heikkinen, 1994; Cridland et al., 2015; Dearnley, 2005; Kallio et al., 2016). According to Bryman (2016), general questions should be asked to be in line with the overall direction of qualitative research. Moreover, they should be worded clearly by not leading participants, but oriented towards the participants so that rich, one-sided, open-ended, unique, in-depth and vivid data can be generated (Åstedt-Kurki and Heikkinen, 1994; Cridland et al., 2015; Dearnley, 2005).

According to Kallio (2016) interview guides include main themes focusing on the core research topic and participants are encouraged to express freely their own experiences and perceptions on the one hand. On the other hand, follow-up questions (also called probes) are used to lead to a better understanding among the participants steering the interview to the field of study (Baumbusch, 2010; Ryan, F. et al., 2009). These follow-up questions can either be spontaneous or designed in advance (Kallio et al., 2016; Rabionet, 2011). Moreover, the information gained will be more accurate and the course of the interview is maintained (Barriball and While, 1994; Baumbusch, 2010; Rabionet, 2011).

Typically, the interview guide starts with aspects that are important for the study but also familiar to the participant (Cridland et al., 2015; Krauss et al., 2009). So, they serve as an ice breaker (Cridland et al., 2015; Krauss et al., 2009). After that, central themes (in-depth) should follow before lighter topics will be discussed at the end of the interview (Cridland et al., 2015).

Each interview begins with an introduction of the researcher, the research topic and research objectives. Moreover, the researcher highlights that anonymity is guaranteed, he asks for permission to record the interview digitally and to let it be transcribed by a software solution. If participants do not allow digital transcription, the researcher transcribes the interview

himself. To be in line with the sampling, each participant is asked to introduce him-/herself, so that socio-demographic data can be filled in.

Finally, it closes with a light topic. All interview questions are associated with the research questions, objectives, methods and techniques via detailed research questions. The linkage between research objectives, detailed research questions, interview questions (including probes / follow-up questions) as well as the sources from which interview questions were derived is visible in appendix III.

The interview guide will be divided into four stages. The first stage will be the introduction, followed by the second stage which focuses on leadership and working in flexible workplaces. The third stage concentrates on trust and working in flexible workplaces before the fourth stage starts, representing the final statements and finish of the interview. The interview guide is attached in appendix IV. It was translated from German to English by the researcher to keep up transparency, but interviews were conducted in German as the study took place in Germany.

Before carrying out the interviews, a pilot testing procedure should be conducted (Kallio et al., 2016). Referring to Kallio et al. (2016) who developed a framework for qualitative research which includes three stages of pilot testing, these tests are necessary to identify questions that need to be rephrased, to confirm the scope of the initial interview guide and to evaluate the feasibility of their application. The first stage is called internal testing in which the research team evaluates the interview guide in order to get insights on general issues (e.g., questions that are not appropriate) (Barriball and While, 1994; Kallio et al., 2016). The research team evaluated the interview guide and rephrased and reorganized questions in June 2020.

The second stage is called expert assessment and concentrates on assessing the adequacy and completeness of the content of the interview guide in regard to the objectives and topics of the study (Kallio et al., 2016). It enabled the researcher to debate the relevance of the questions and to obtain valuable advice on the formulation and ordering of the questions (Barriball and While, 1994). In this study, one professor with experience in HR research gave valuable feedback on the interview guide, also in June 2020. After the expert assessment one relevant aspect has been added in the introductory part of the interview guide. Both the questions and their ordering were classified positively.

According to Kallio et al. (2016), the field-testing represents the third stage in which the interview guide is tested with possible interviewees. Afterwards, interview questions could

be re-ordered or rephrased so each theme of the interview guide is covered (Kallio et al., 2016; Krauss et al., 2009). Moreover, after the field-testing the researcher knows how long an interview will approximately last and if all questions are expressed comprehensibly (Barriball and While, 1994; Cridland et al., 2015; Kallio et al., 2016). Furthermore, field-tests are used to assess whether they have really caused the different experiences and perceptions among the participants (Barriball and While, 1994; Chenail, 2011; Kallio et al., 2016). Within this study, the field-testing was conducted with a business consultant who holds a major in leadership and culture. The test uncovered that it is necessary to emphasize that a flexible workplace goes beyond home-offices. They seem to be the subject of discussion because a lot of employees are currently working from home due to the COVID-19 pandemic, but this study is not limited to home-offices. Therefore, a short explanation of flexible workplaces has been added directly after asking the first question.

The interview guide (appendix IV) is the one which will be used in the qualitative expert interviews, so it is the final version after all pilot tests.

4.2.5 Sampling and identification of experts

In this chapter, sampling will first be discussed from a theoretical perspective. Second, the boundaries for this study will be discussed. Third, the sample for this study will be described.

Within qualitative research parameters can be refocused while conducting fieldwork (Miles et al., 2014). But it is important to set a general focus, derived from a conceptual framework as well as research questions (Miles et al., 2014). These can also set boundaries, so the depth and breadth of a study/a sample is designed (Baxter and Jack, 2008; Miles et al., 2014). Boundaries are in this case comparable to inclusion and exclusion criteria, i.e., if a certain aspect is (not) studied, used in quantitative studies (Baxter and Jack, 2008).

According to Miles et al. (2014), sampling is concerned with which people will be interviewed or observed in which environment. In qualitative research sampling is not about receiving a sample that represents the population but that is chosen due to their appropriateness to the aims of the research (Bryman, 2016). In case studies the sample should help to deeply understand the case, so the sampling is based on the criteria of the people in association with the research questions (Bryman, 2016). In qualitative research samples are often smaller than in quantitative research (Miles et al., 2014). The foundation of this research is a purposive sample which is a non-probability sampling and not seeking to choose participants randomly (Berg and Lune, 2014; Bryman, 2016; Miles et al., 2014; Yin, 2011). Therefore, it is not possible to generalize results to the population (Bryman, 2016). This is a more strategic

sampling strategy because it is focused on a case (Miles et al., 2014). As this study is a holistic multiple case study, following the replication logic (Yin, 2014; 2012), findings are more confident due to multiple-case sampling (Miles et al., 2014). So, validity, precision, trustworthiness and stability of findings can be strengthened (Miles et al., 2014). Since available data is not necessarily the best source, the sample should not be a convenience sample in which data is only generated because the sample is easily available (Yin, 2011), but it should be purposeful which can include snowball sampling where interviewees may recommend other possible interviewees (Berg and Lune, 2014; Yin, 2011). It is important to consider why (not) to include the person into the sample before the interview takes place (Yin, 2011).

How many people will be interviewed cannot be answered as easily as in quantitative research where power analysis help to answer this question (Yin, 2011). In qualitative research it is more about the complexity of the topic as well as the depth of analyzing data (Miles et al., 2014; Yin, 2011). However, it is not only about the sample sizes (also called instance) but also about how the sample is composited (Yin, 2011). Miles et al. (2014) recommend a minimum number of five rich cases for multiple-case sampling, although earlier research has shown good results with fewer cases. Miles et al. (2014, p. 34) state that “the price [for fewer cases] is usually thinner data”. So, the data generation via interviews is stopped when the level of theoretical saturation is reached (Creswell, 2014; Marshall and Rossman, 2016). This means that additional interviews will not uncover additional findings (Marshall and Rossman, 2016). Charmaz (2006, p. 113) stated that “categories are ‘saturated’ when gathering fresh data no longer sparks new theoretical insights, nor reveals new properties of these core theoretical categories”. The risk is that categories are declared as saturated although they are not (Charmaz, 2006). Dey (1999, p. 257) states that saturation is “another unfortunate metaphor” and suggests calling it theoretical sufficiency indicating that categories are explained by and in accordance with data. This underlines that it is impossible to know everything and that there is never only one truth (Marshall and Rossman, 2016). Therefore, concerns for the exclusion of analytical capabilities and the preparation of surface analyses exist (Charmaz, 2006). Due to this, it is necessary to recognize “what is happening in the field and [to] be willing to grapple with it” (Charmaz, 2006, p. 115).

In the German-speaking area expert interviews are widespread but in the Anglo-American area expert interviews are mostly unknown (Littig, 2009). The literature differentiates between the elite and experts that can be interviewed (Littig, 2009). According to Littig (2009) the decision if experts or elites are interviewed is depending on the research interest and the

research area. So, experts are to be interviewed when “professional or occupational explicit or tacit interpretive knowledge (know-why), procedural knowledge (knowhow) and process knowledge” are researched (Littig, 2009, p. 109). Elites are interviewed when career paths, lifestyles, social power, memberships and so on are the focus (Littig, 2009). Therefore, expert interviews explore knowledge of experts as qualitative research (Meuser and Nagel, 2009). Experts are able to solve specific problems because they understand topics in-depth and have special (not common) knowledge which is not accessible to others and it must be theoretically founded (Froschauer and Lueger, 2009). Moreover, “experts can thus provide assistance in situations of uncertainty [...] or help solve complex problems (for example organizational consultants)” (Froschauer and Lueger, 2009, p. 220). Furthermore, the composition of experts from different functions can lead to a heterogenous sample with various points of view (Wroblewski and Leitner, 2009). Therefore, in this study expert interviews will be used to generate data about occupational knowledge. So, sampling is not an easy task but rather a crucial one with influences on the analysis (Miles et al., 2014).

The boundaries for this study will now be described briefly. This study will take place in Germany, so the geographical focus is set. This also means that only CEOs or HR managers (or comparable) of German companies are included in this sample, representing experts in their field. Moreover, this research focuses on SMEs which is also visible in the conceptual framework that was designed for SMEs. Therefore, the experts mainly stem from German SMEs (following the definition of the European Commission (2003), cf. chapter 1.2.4).

Table 4.1 lists the interviewees, including their position, professional experience, industry, company size (number of employees) and whether they are from an SME. Experts were identified through personal business contacts, through the usage of business networks and through snowball sampling. In Germany a platform called “XING” is widespread. It is comparable to LinkedIn, which is more likely to be used in an international setting. Therefore, the participants were either already known by the researcher, or the researcher was able to get such a comprehensive picture of the individual through their online profile that it was clear that they met the relevant criteria, i.e., being a CEO or HR manager in a German company, for inclusion in the sample. In order to gain insights from different industries and companies, there was no limitation to one particular industry. The focus of the analysis is SMEs, which, as a consequence, make up the majority of the sample. Thus, a purposive sample has been generated. The participants mainly stem from German SMEs (75 percent). In addition, participants from larger companies (25 percent) will be included in the qualitative study as well because these often have a professional human resource management

(Lepak and Snell, 2002). This is in line with existing research from Bacon and Hoque (2005) who underline that SMEs can learn from larger companies on how to adopt HRM practices. In this vein, the external environment is also included in an SME analysis (Guest, 2001; Mendy and Rahman, 2019). In addition, theory development for SMEs is often derived from large companies (Chaston and Mangles, 2002; Gabrielli and Balboni, 2010). From the methodological viewpoint, Yin (2011, p. 88) also recommends to “interview some people whom you suspect might hold different views”. Saunders et al. (2016, p. 298) argue in the same vein, as heterogeneous purposive samples are likely to “reveal/illuminate key themes”. Hence, the data will not be biased as this study combines the broader level (large corporates) and the narrowed level (SMEs), as recommended from Yin (2011). Therefore, participants stem mainly from SMEs, but also from large corporates. The average company size of this sample is 1082.3 (mean 59.0). Because there is no limitation set to a specific industry, participants are chosen to originate from different industries for generating a broad foundation. The interviewees are leaders/managers in human resource management departments or company leaders who have considerable experience in leadership and business in general. Since this study does not focus on one industry and since objective knowledge is to be used as a basis for the further development of the framework, management consultants with a focus on HRM will also be interviewed who can contribute cross-sector knowledge. This knowledge is therefore not subjectively limited to one company, but includes a cross-company point of view. So, they are experts based on their occupational knowledge because they work in the human resource management department or as managing directors which qualifies them to be experts on topics of corporate human resources (Littig, 2009). 83 percent of the sample are male and 17 percent of the sample are female. On average, the participants have 10.0 years of professional experience in their current position and 28.3 years of professional experience in total.

Table 4.1: Qualitative study sample

Own table

| No. ⁸ | Position and background | Professional experience current position / total (years) | Industry | Company size (FTE) | SME |
|------------------|--|--|---|-----------------------|-----|
| I1 | Cross-company Managing Director of a group of companies | 8 / 20 | Software development | 109 | Yes |
| I2 | Head of Human Resource Management and Personnel Development | 11 / 15 | Metal product manufacturer / metal industry | 310 | No |
| I3 | Commercial Director & Chairman of the board of an association for the promotion of vocational orientation | 0.5 / 26 | Housing construction and housing maintenance & vocational orientation | 32 | Yes |
| I4 | Owner & Lecturer at a German university, former Global Director HR at a company in the tourism industry (70,000 employees) | 14 / 35 | Business consulting, focus on HRM | 0 | Yes |
| I5 | Managing Director & Business Consultant | 5 / 18 | Business consulting, focus on new work | 26 | Yes |
| I6 | Managing Director | 8 / 27 | Fueling technology, fuel tank facilities, mineral oil | 73 | Yes |
| I7 | Executive Director, focus on HRM, Administration and Finance | 20 / 27 | Internet services | 114 | Yes |

⁸ These abbreviations are also used when the results are presented and discussed in the following chapters.

| | | | | | |
|-----|--|---------|---|--------|-----|
| I8 | Managing Director & HR Consultant | 7 / 37 | Employment Agency / Head-hunting | 3,5 | Yes |
| I9 | Managing Director & Lecturer at a German university of applied sciences | 20 / 25 | Trade and processing of technical rubber products | 25 | Yes |
| I10 | Head of Human Resources, former Member of the Executive Board in an automotive sales company (300 employees) & former Head of Human Resources in a plant construction company (16,000 employees) | 2 / 30 | Textile retail trade | 250 | No |
| I11 | Managing Director | 5 / 40 | Services, Trade & Construction | 45 | Yes |
| I12 | Head of Human Resource Management | 19 / 40 | Food retail trade | 12,000 | No |

4.2.6 Data generation: Conducting interviews

The interviews have been conducted with the already described sample between June and August 2020. After the first four interviews the interview guide was further developed. The field notes which have been taken during and after the interviews uncovered that it is necessary to also ask a question on the interplay of trusting and/or controlling employees. This question was added as a probe (follow-up) after asking question 5.1. Moreover, the sixth question has been reformulated, so it is more understandable to the participants.

Ten interviews have been conducted at the location of the participants so both parties (participants and the researcher) felt well, safe and comfortable in a quiet surrounding free of disturbances (Dearnley, 2005; Saunders et al., 2016). The other two interviews have been conducted remotely as desired by the participants for which a synchronous videoconferencing software (web conferencing) and the internet were used (Saunders et al., 2016). Face-to-face interviews were preferred, but if participants insisted on exchanges taking place remotely, interviews have been conducted virtually using the software Microsoft Teams. Also, in a virtual setting a comfortable, safe, quiet and pleasant surrounding was set up which was free of disturbances (Dearnley, 2005; Saunders et al., 2016). In such a situation both parties (participant and researcher) have the opportunity to access the interview from a safe and familiar location (Hanna, 2012).

Before the interview started – either face-to-face or virtual – every participant was asked to sign a declaration of consent to the generation and processing of personal interview data following the General Data Protection Regulation (GDPR). All participants signed this document and agreed on its contents. In order to underline how important the protection of private data is, the first stage of the interview (introduction, sociodemographic data) was not recorded so that personal data is only available on the handwritten field notes. The other three stages have been audio-recorded (using the ZOOM H6 handy recorder) as required by the literature (Rabionet, 2011) so that they can be transcribed and analyzed afterwards. The participants were informed by the researcher about the interview themes in advance so validity, reliability and credibility can be promoted (Saunders et al., 2016). The interviews lasted between 45 and 90 minutes and were conducted in German, so in-depth conversations were conducted focused on the aim of the research and led by the interview guide (Cridland et al., 2015; Saunders et al., 2016).

4.2.7 Implementation of data analysis: Transcription and Gioia methodology

Since a transcription represents a part of rigor in qualitative research (Tracy, 2010), all conducted interviews are transcribed. This means that spoken words are transformed in a text-form (Bryman, 2016; Kowal and O'Connell, 2017). According to Dearnley (2005), some qualitative researchers like ethnographers expect that the researcher transcribes every interview him-/herself to be immersed within the data. But the reality shows that computer software or professional services are helpful in cases of transcribing interview data and they are outperforming downsides of non-professional transcribers (Dearnley, 2005; Saunders et al., 2016). For this study, the researcher uses a computer software called AmberScript which transcribes the audio-recordings automatically into text. This software is used by different universities (e.g., University of Amsterdam and Humboldt Universität Berlin) and provides transcripts with an accuracy of 90 percent and which is compliant with the European Union General Data Protection Regulation (AmberScript, 2020). Furthermore, the researcher has read all transcripts while listening to the audio file in parallel. This leads him to delve deeply into the field, even though he is not transcribing the whole interview himself. Moreover, it leads to the transcript becoming an error-free transcript of the interviews at the end, as the researcher cleans up mistakes. So, texts are generated out of audio-recorded voices which lead to data (Peräkylä and Ruusuvuori, 2011). These are “one of the best (if not the best) of the bridges from rich qualitative evidence to mainstream deductive research” (Eisenhardt and Graebner, 2007, p. 25).

The level of detail of the transcripts varies greatly and ranges from the transcription of any loud (e.g., ah) to a well readable text (Miles et al., 2014). In this study, the standard orthography was used for transcription meaning that the transcriptions focus on writing language norm. This implies that filler words, repetitions and dialects have not been transcribed if they did not change the meaning of the sentence or the comprehension (Hussy et al., 2013). Döring and Bortz (2016) state that only in seldom cases it might be use- and helpful to transcribe every single modulation of the voice or pause, e.g., when researching linguistics. As this study constitutes management research and the comprehensibility of the text is in the focus despite from feelings or filler words, the relevant information have been transcribed. However, the interviews are transcribed totally and not only sequentially in order not to blank out relevant information (Hussy et al., 2013). In order to anonymize the transcripts data which eventually identifies the participant has been removed (e.g., names of cities) (Döring and Bortz, 2016). Moreover, a full transcription was conducted, so every interview has been

transcribed fully (Döring and Bortz, 2016; Hussy et al., 2013). If participants requested to receive a softcopy of the transcript, it was sent to them after completion of the transcription. The transcripts of the interviews are not included in the appendix for privacy and thus ethical reasons.⁹

Within this qualitative study, the Gioia methodology is used for analyzing the generated data, as it has come to be accepted as the gold standard for implementing interpretive research (Langley and Abdallah, 2011; Mees-Buss et al., 2022; Pratt, M. G. et al., 2022). Between 2014 and 2018 62.2 percent of qualitative articles published in the *Academy of Management Journal* used the Gioia methodology (Mees-Buss et al., 2022), as it illustrates very well how raw data is being aggregated in a thorough manner (Reay, 2014). This is also why the methodology was developed as the authors wanted qualitative research to be more rigorous (Gioia et al., 2013). There are two ground assumptions; first, researchers should appreciate the knowledge of interviewees and to give them a voice; second, researchers are also knowledgeable and therefore well-informed (Gioia et al., 2013).

According to Gioia et al. (2013, p. 20), “a myriad of informant terms, codes, and categories emerge early in the research”. These terms are then to be grouped in many different 1st-order categories as close as possible to the original wording of the informants (Gioia et al., 2013). As a consequence, a large number of 1st-order categories can arise leading to researchers that feel lost. This 1st-order analysis therefore focuses on informant-centric codes and terms.

In the second step, researchers look out for differences as well as similarities in the 1st-order categories (comparable to axial coding by Strauss and Corbin (1998)) in order to minimize the categories down to a reasonable number which is manageable (Gioia et al., 2013). At this point it is obvious that the ground assumption of being a knowledgeable researcher (or agent, how Gioia et al. call it) is important because “knowledgeable agents [...] can (and must) think at multiple levels simultaneously (i.e., at the level of the informant terms and codes and at the more abstract, 2nd-order theoretical level of themes, dimensions, and the larger narrative” (Gioia et al., 2013, p. 20). So, the 2nd-order analysis uses researcher-centric dimensions, themes and concepts (Gioia et al., 2013; Van Maanen, 1979). These 2nd-order categories become labeled or described through phrases (as close to the participants wording as possible) and the underlying structure is analyzed (Gioia et al., 2013). So, the 2nd-order analysis focuses on the theoretical perspective in order to better explain and describe the

⁹ The transcripts are available on request for inspection.

phenomena under research (Gioia et al., 2013). At this stage, concepts (forerunner of constructs) are often in the focus which are lacking theoretical references (identity ambiguity) (Corley and Gioia, 2004; Gioia et al., 2013). Alternatively, existing concepts that are relevant in a new area are in the focus (Gioia et al., 2013; Gioia et al., 2010). According to Gioia et al. (2013), this procedure will be done until a theoretical saturation is gained. Finally, researchers “investigate whether it is possible to distill the emergent 2nd-order themes even further into 2nd-order ‘aggregate dimensions’” (Gioia et al., 2013, p. 20), so a higher level of abstraction is reached. MAXQDA Analytics Pro 2020 (Release 20.1.1) software was used to code the data. 644 passages were coded. First order codes across the interviews form the first-order categories which are sometimes named as *in vivo* codes to be close to the interviews (Dacin et al., 2010; Gioia et al., 2013). Via an iterative procedure the second-order categories are set up which then lead to the overarching aggregated dimension (Dacin et al., 2010; Gioia et al., 2013). So, the transcripts have been read multiple times out of which first-order concepts emerged. These have also been revisited several times and clustered in second-order themes. Finally, the second-order themes have been set up by revisiting the second-order themes, but also the first-order concepts and the transcripts.

These three categories (1st-order concepts, 2nd-order themes and aggregated dimensions) are then presented in a data structure, providing a visual representation by using boxes and arrows of how raw data was analyzed and aggregated in higher levels of abstraction (Gioia et al., 2013). This represents a demanded component of rigor (Pratt, M. G., 2008; Tracy, 2010), following the statement “no data structure; know nothing” (Gioia et al., 2013, p. 21). Moreover, reporting both, participants via 1st-order categories and researcher via 2nd-order categories, qualitative rigor is not only demonstrated by building relationships between concepts but also by presenting insights transparently which constitutes a key element of high-quality qualitative research (Gioia et al., 2013). Referring to Gioia et al. (2013) the next step is to build theory out of the generated data. At this point, relationships are set up among concepts which “are now made transparent” (Gioia et al., 2013, p. 22).

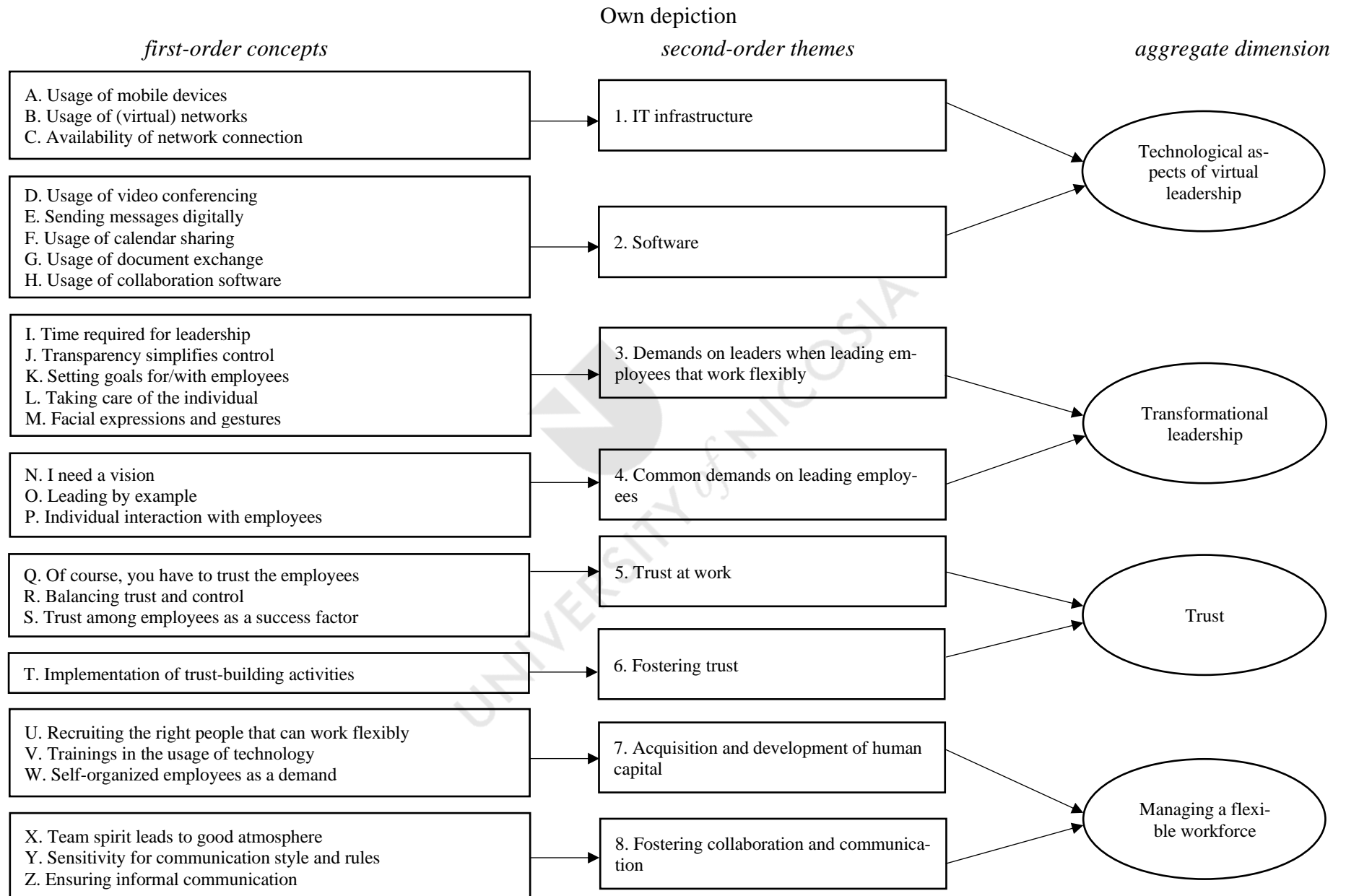
So, the Gioia methodology enables a complete and objectifiable representation of the evaluation process and makes the interpretation of the results more comprehensible and verifiable than, for example, if only purely verbal transcripts are summarized. This emphasizes the quality of the results. Therefore, the Gioia methodology – the gold standard for qualitative research – was chosen for this qualitative study as it is a rigorous procedure, fulfilling the quality criteria of qualitative research (like credibility due to a table with quotes linked to the first-order concepts, or objectivity which is established due to the Gioia table).

4.3 Description and discussion of findings

As pointed out by Gioia et al. (2013), the data structure is extremely important. Therefore, the data structure is visualized in figure 4.1 which differentiates the 1st-order concepts, 2nd-order themes and aggregate dimensions. Moreover, table 4.2 presents representative data which is associated with the first order-concepts of each second-order theme, as required by Gioia et al. (2013). This fulfills the requirement to present two quotes per code to maintain the quality criteria of confirmability as well as authenticity.



Figure 4.1: Data structure



The following table (see an excerpt below, the entire table can be accessed in appendix V) additionally supports the findings through transparently showing representative data for the first order data which substantiate the second-order themes, underlining the linkage between table 4.2 and figure 4.1.

Table 4.2: Dimensions, themes, categories, and data

Own table

| Aggregate dimension, 2nd order themes and 1st order concepts | Representative data |
|---|--|
| Overarching aggregate dimension: Technological aspects of virtual leadership | |
| <i>1. IT infrastructure</i> | |
| A. Usage of mobile devices | <p>A1. “What I am getting at is that two years ago we started replacing every stationary PC here in the company with a mobile workstation” (I1).</p> <p>A2. “And, of course, the smartphone has become a daily companion somewhere in the meantime, to communicate, to organize one's work, to retrieve emails. Of course, this works from anywhere then” (I2).</p> |
| B. Usage of (virtual) networks | <p>B1. “We had all possibilities via laptop. You could access our data, but also the customer data via the software TeamViewer” (I6).</p> <p>B2. “One of the basic requirements for flexible working is very powerful IT equipment for employees. That means I got to know it at a former employer who had several thousand SAP workstations. That these employees had access to the SAP network from everywhere” (I10).</p> |
| C. Availability of network connection | <p>C1. “Then, of course, it is important that you use a technique that works well at low thresholds. Especially in Germany there are big problems with the mobile phone network. Is that even possible? Does it work? Do I have internet access everywhere?” (I3).</p> <p>C2. “You have to have the stability to be able to access servers, information and the like with your devices wherever you are, so that you can process this information very quickly” (I11).</p> |

2. Software

D. Usage of video conferencing

D1. “I think that these video conferences are not really unpleasant, I have to say. Videoconferencing leads to a very focused discussion of the topic and that one is preparing oneself, right” (I7).

D2. “In the meantime, you may want to produce or discuss results again via video conference” (I5).

The results will be discussed in detail in the following chapters. The discussions always start from the overarching theoretical dimension and then concentrate on the second-order themes with its associated first-order concepts including direct quotes from the interviews, again to maintain the quality criteria of confirmability as well as authenticity.

4.3.1 Technological aspects of virtual leadership

The interviews uncovered that there is a strong need for the availability and usage of technology when leading flexibly working employees:

“I think there is the big issue of digitization in all areas” (I11).

Therefore, the IT infrastructure, which in this study focuses on the usage of mobile devices, of (virtual) networks and on the availability of network connection, will be analyzed in this chapter. According to Hou (2020, p. 577), “IT infrastructure is the foundation for all kinds of information resources” and serves as an enabler for connecting as well as sharing information. Especially companies that have several subsidiaries which are geospatially dispersed (or international businesses) understand IT infrastructure as a very important aspect (Broadbent et al., 1999) and its performance is a company’s resource according to the resource-based view (Barney, 1991) which requires “a fusion of human and technical assets” (Broadbent et al., 1999, p. 158).

Moreover, it is about using the right software (e.g., video conferencing) when leading employees that work flexibly. These software solutions will also be discussed. The overall aim of using ICT is to have IT solutions that make the working life easier:

“And that is actually the goal. I want to have tools, I want to have IT that makes work fun and that will perhaps in the future also take things off my hands via artificial intelligence, that simply help me to track things, to track processes” (I8).

4.3.1.1 IT infrastructure

In order to communicate virtually a well working IT infrastructure is needed so leaders can reach out to employees that work flexibly. Therefore, mobile devices are being used by leaders and employees:

“What I am getting at is that two years ago we started replacing every stationary PC here in the company with a mobile workstation” (I1).

So, the laptop enables employees to access files and to work from almost anywhere. This also includes the usage of mobile phones (e.g., via voice over IP) instead of traditional land-line telephones for all employees because these are portable. Smartphones are used to communicate with leaders, employees or customers and others as well as to organize one’s own work independently from a specific location.

However, companies are nowadays updating their IT infrastructure in order to enable employees to work flexibly. This also includes the company, which has been betrayed, as they are heading forward and will equip their employees with tablets in the near future which will result in a simplification of work (reports can be written and uploaded at any time and everywhere). All of these aspects are understood as fundamental for flexible work. Moreover, the usage of private devices is viewed as counterproductive. Therefore, it is up to the companies and the leaders to equip their employees adequately:

“Of course, that's part of it by default somehow, that you also equip the employees properly” (I2).

A webcam with high definition is an important device because this enables leaders to see their employees’ facial expressions and gestures (comparable to face-to-face communication):

“Our employees are equipped with extremely high-definition cameras. This means that I can already see when the corner of my eye goes up or when there is a nuance” (I8).

Well working mobile devices support the usage of software as well. Some companies choose to use the same devices throughout the company which facilitates the response to questions or problem-solving within the IT department. However, if companies aim to implement flexible work and, as a result, invest in ICT, it is recommended that they do it early enough, as purchasing a large number of ICT devices for the workforce at once can be difficult. Some companies discovered this during the COVID-19 crisis.

These mobile devices have then to be connected to a (virtual) network which enables employees to access a company's server from anywhere at any time.

“Especially those who are not on-site must of course be well connected. They must access here to the firm network” (I2).

Due to this, they can access all files and run all the relevant software systems which are needed to work productively. This also includes relevant customer data. This is necessary because employees eventually work at the customer's location and have to handle with the customer data there as well:

“One of the basic requirements for flexible working is very powerful IT equipment for employees. That means I got to know it at a former employer who had several thousand SAP workstations. That these employees had access from everywhere, to the SAP network, then could see what the performance level of the wind energy generators was, what jobs are to be done and much more. But the same applied to the people who worked exclusively in the office” (I10).

However, the usage of (virtual) networks can for instance be enabled via cloud computing:

“Yes. And we also have a [...] cloud system” (I9).

The usage of such networks is a fundamental aspect of working flexibly since this is the enabler to let employees enter the company's world virtually. Another important aspect to be considered is network connection availability. So, it is about two different networks: The first one (which has already been described) focuses on connecting mobile devices to a company network while the second one (to be described now) concentrates on the general possibility to get access to (public) networks. This is important because a company can allow mobile devices to be connected to the firm network but if the mobile device has no possibility to access the internet, so the access to the company's network does not work either. Therefore, broadband connection as well as mobile phone network are highly important if employees work flexibly:

“Then, of course, it is important that you use a technique that works well at low thresholds. Especially in Germany there are big problems with the mobile phone network. Is that even possible? Does it work? Do I have internet access everywhere?” (I3).

Some companies are currently equipped with glass fiber connection which results in a faster internet speed. But it is not only about having access with high speed, but also about having

a stable connection which allows employees to work and to access the company's network continuously:

“You have to have the stability to be able to access servers, information and so on with your devices wherever you are, so that you can process this information very quickly” (I11).

So, if leaders do not take care of these aspects or hide that such problems exist, this may lead to a failure of their leadership:

“We experience it right now during the Corona crisis, how many people do not have a fixed line connection, i.e., no DSL connection anymore or live in areas where LTE barely works. That means, my leadership actually fails because of the technology. And that is a huge problem for me, especially in the less developed areas, which we have in region 1 at the moment. It is the biggest problem for me” (I12).

This statement highlights the relevance of a well-developed IT infrastructure in the respective country or region as well as within a company.

4.3.1.2 Software

Besides the IT infrastructure, employees need the right software solutions to work flexibly, like video conferencing software. Employees that work remotely are reached via telephone or video conference. Using video conferences is comparable to talking to employees who are at the same location as the leader:

“So video and on-site staff are relatively similar” (I7).

When leaders compare video conferences and telephone calls, video conferences are seen as a step ahead, because it is possible to also see each other which is beneficial for both parties (leader and employee) because facial expressions and gestures are visible. Due to the COVID-19 pandemic the amount of video conferences increases. Moreover, video conferencing enables leaders to shortly discuss employee's results and to present them virtually:

“And maybe do a little more about visual things, that you prepare an Excel chart or whatever, which you then talk about together” (I12).

Performance reviews can also take place via video conferences, although some leaders prefer personal performance reviews:

“What certainly does not work is if it has a disciplinary character. In my opinion, this is only possible in a personal conversation, and in my opinion, respect for the

other person is also necessary, even if it is perhaps an unpleasant situation, but I have to show my colors as a leader and cannot hide behind the screen or behind the camera” (I10).

However, these video conferences are understood as a very effective and efficient way to communicate since informal communication is reduced to a minimum or is canceled:

“And now you are in a meeting, a virtual one, and have an outcome that gets at least 80 percent close to the result [of a face-to-face meeting]. That is quite interesting. [...] Of course, you still have to meet from time to time, so you can have a drink together [...]. But working on this agenda works great on a virtual basis” (I9).

Video conferences can be one-on-one or with a team. In addition to meeting each other in video conferences, messages are being sent digitally. These can be emails, SMS or messages within an instant messaging service (which is seen as problematic by some leaders concerning data protection). Moreover, sending messages digitally can be integrated in a collaboration software in which different virtual rooms or channels may be implemented focusing on various aspects:

“A chat and acquisition channel, a general channel, a chat corner” (I5).

Some leaders differentiate via which medium specific messages should be sent. Any messages concerning the operational business should only be sent within a chat to which all team members have access, while communication regarding individual employees may be sent via email:

“If an employee sends me something in the operational business, we are only talking about the classic operational business here, I don't want it sent by email, but he rather has to upload it in SharePoint, in Teams, in One-Drive, according to the guidelines. What he sends me, of course, is a vacation ticket” (I8).

Moreover, calendar sharing is used by leaders and employees. Appointments and absences will be noted so that everyone is informed whether a person is available or not. So, it is not only about sharing the calendar but also about appointment management. This makes communication easier if everyone is informed about when an employee or a leader can be reached out to. In addition, this leads to a higher transparency for both – leaders and employees. Therefore, by sharing the calendar every leader (and every employee) has to face the fact that others know about critical appointments:

“When you say, “People, I’m sharing my calendar,” then we were faced with the fact that as a human resources manager you also have difficult appointments. My managers always knew that I was having a conversation with this and that employee and everyone knew that manager XY hasn’t performed well for quite some time now. Why do you think she’s there now? But that was not an issue at all” (I4).

According to interviewee 4, it is also a matter of being a role model. Leaders should not require employees to share their calendars when leaders do not do it as well. Leaders should be the first to share calendars and employees should follow.

To leaders it is important that documents are stored at a virtual location where a document exchange between employees (and leaders) is possible. Due to the leaders, it makes the working life less complicated if employees can up-/download files from wherever they are at all times:

“This will make our work easier as the invoice can be written immediately without the accountant having to maintain the articles” (I6).

Furthermore, this helps leaders to check the status of projects because leaders and employees can open files since everyone knows where these are stored. Like the communication flows, data should also be stored at the agreed-on virtual location rather than being sent via email. However, it is important to set up a rights structure so that not every employee has access to all files, but only to those that are relevant for him/her.

Within the human resources department digital personnel files or human resource management systems start digitalizing analogous and paper-based processes into a virtual human resource management, so that files or relevant data is also accessible from nearly every location. Former versions are file structures on the server which are accessible:

“Of course, we already had shared drives on which documents are stored. And we have always had that with our employees in the human resources department. We have drives where all our references are stored or they are stored in libraries. We’ve actually always known it this way” (I12).

Moreover, storing data virtually deals with knowledge management. So, if an employee leaves the company or is sick, the other team members can take over. Furthermore, companies do not depend on single employees because their knowledge is accessible:

“But you always have to keep in mind. One can be absent, diseases, whatever I know. So, and then this knowledge must be available somewhere. And therefore, I

find it also in principle good that I can define not only the file location as such. You can access it, but also that I am perhaps in exchange with a few colleagues” (I11).

Collaboration software can combine the before-mentioned aspects in one single software. Interviewee 1 describes how the aggregation of stand-alone software into one collaboration software has changed and set a better foundation for flexible work:

“I am of course interested in such communication systems as Teams, Slack etc. All those that contribute to the collaboration of companies are essential to me. We have noticed that in the last five years we have made this change. We've seen systems that standardize information within the company move away from Word documents and Excel spreadsheets to Confluence systems, for example, but also away from email to messenger-like systems, such as Slack in our case. In my view, these are the minimum things that are needed, so to say, to bring this flexibility into the work” (I1).

Due to such collaboration systems, every employee can be reached out to in individual or group chats, data can be stored and exchanged and video conferences are possible as well. Moreover, collaboration software functions as an internal business network which can include a wiki. In addition, (interim) results can be noted and made transparent for everyone else:

“Or which collaboration tools I use so that not only employee X knows this, but also employee Y, who may also be involved in this project” (I8).

Both (interim) results and the availability of employees can be visualized. This also includes room for informal exchange, like a virtual chatting corner. So, such software supports leadership because leaders can use collaboration software for staying in touch with employees via video conferences or chats. Interviewee 5 sums it up and states:

“A communication software, Microsoft Teams for example, where you can chat regularly with each other, exchange messages, share data with each other, but also have video conferences. Collaboration, communication collaboration software” (I5).

4.3.2 Transformational leadership

Leadership is – besides technology – another important aspect as it focuses on interactions between leaders and employees wherever and whenever they are working. It can be differentiated between the demands of leading employees who work flexibly and those who do

not. So, there are aspects which are solely relevant for leading employees that work flexibly while there are also features that account additionally for employees that work at the premises of the company. These 2nd-order themes will be discussed in this chapter.

4.3.2.1 Demands on leaders when leading employees that work flexibly

Interview participants agreed on the aspect the leading employees who work flexibly is more time consuming than leading employees who are on-site because occasional discussions are reduced as managers are no longer able to simply have a look at the employees at the workplace (e.g. in the office) and to discuss (interim) results quickly at the employee's desk:

“The communication challenge is greater if I don't have direct access to the employees. By access, however, I also mean that an employee does not have direct access to his or her supervisor. Conversations in the hallway, at the copier, in the break room are a thing of the past when I'm on the move. That means I always have a controlled conversation situation” (I3).

This leads to the situation when managers have to invest more time in terms of calling employees, talking to them and leading them. Moreover, employees are no longer included in the system which takes place at the workplace:

“People are now all working from home or somewhere else and they actually need more leadership, because they are no longer integrated into a system where you can meet a colleague and have a cup of coffee, chat with someone and walk into the manager's office. None of that happens anymore. So the time required for leadership is increasing” (I4).

Since leaders do not meet their employees locally, it is up to the leaders to structure their leadership differently. If leaders offer this opportunity to employees (67.4 % of employees want to have it and 43.4 % of companies are offering it (Weitzel et al., 2019)) they have to respect employees who make use of this. Furthermore, they have to motivate themselves to invest this additional amount of time in order not to forget one of their employees because they are not on-site. All in all, leaders have to invest more time in leading employees who work flexibly:

“So, if I now compare leadership on-site as opposed to leadership at mobile locations and then maybe even at different working hours, the effort for mobile work / different working hours is exorbitantly higher” (I8).

Another demand on leaders when leading employees that work flexibly is to strive for transparency since this simplifies (or implies) control. An increased transparency (e.g., via usage of software) results in a situation in which everyone is informed about the status quo. This also includes the leaders who have to be transparent. For the interviewees it was important to note that transparency is seen as supporting leaders (in terms of articulating a vision and setting up/discussing goals) instead of controlling employees:

“When we talk about goals in a team, this is not control, but rather transparency and goal attainment talks, for example. Or feedback talks. How is it going, or where are we at the moment? Or status meetings. But that is not control. So, I do not stand next to the employee as a manager and say have you reached your goal? Instead, we talk about where we are right now? Have we reached the goal and if we have not reached it, why have we not reached it? But I am not controlling at that moment” (I5).

However, if a leader is able to see every element of the status quo and to see everything related to the employees or the team, leaders can control employees. Leaders control the results (which are available due to transparency) and check those detached from trust:

“At the end of the day, you can see that in the results. I think that trust is perhaps a bit overrated. I can do it. I can tell from the results whether something works or not” (I9).

This transparency can be achieved via talking about the current situation in different tasks or projects. Moreover, by using ICT transparency can be raised / achieved as well, e.g., by simply sharing the calendar transparency can be supported.

Interviewees agreed on the point that employees should be led by objectives (within the relationship between leaders and employees, but not within the relationship between leaders and lower-level leaders). Leading employees via group goals comes in line with the transformational leadership (fostering the acceptance of group goals):

“Leadership is shaped by agreeing on objectives. [...] Yes, if I have agreed on objectives and these objectives are aligned with the employee. [...] then everybody can do what they want to do” (I9).

“Group goals? Yes, of course, must be transparent, just like goals with individual employees, the same basically applies” (I3).

These goals do not necessarily have to be group goals and are replaced by individual goals if the tasks within a group are too diverse. Moreover, some leaders use both – group goals to foster teamwork and individual goals in terms of bonus systems. If goals are used to lead employees, these goals have to be precise so that everyone is able to understand them. Otherwise, leadership will be negatively affected. If employees work flexibly this has to be considered in defining and setting goals including expected outcomes because they eventually have longer periods of time to achieve them (employees decide autonomously when to work if they have flexitime). In addition, these goals should be in line with the objectives of the company, motivate employees and represent the employer as an (possible) employer of choice where people want to work for. Moreover, these goals can be used as an orientation or guideline for employees so they know what to do. Furthermore, these goals may increase transparency if they are discussed openly. These guidelines then enable employees to decide independently when and where to work:

“And these target agreements must of course meet these legendary smart criteria, i.e. they must be precisely specific, measurable, agreed upon and so on. This measurability is important. If this is given, then everyone can actually do what they want and how they want to do it. Can work from where and for how long and we actually do it [...] [however] not everyone has target agreements. But it is so that all our people are available 24 hours, 7 days a week, via email and so they receive it at home and then simply decide for themselves what is important, when and why, and what can actually go away” (I9).

Organizing how group goals can be achieved and presented can be supported via the usage of ICT. From the point of view of a leader, this leadership has to be adaptable to various situations because goals have to be set and to be discussed virtually using software. All in all, leaders seem to rely on their employees to work towards their goals and to do their best to achieve them. If this is not the case, then leaders use goals with a close deadline to be in touch with employees more often:

“Also agree on short-term goals to stay in conversation. ‘I’ve got a payroll that needs to be done. Please take a look at it and get back to me within an hour.’ When I get the feedback, he also notices: ‘Watch out, he’s already got his eye on me, he won’t just let me walk around like I want to’” (I12).

Taking care of the individual is another aspect which will be discussed in terms of leading flexible employees. According to the interviewees, it is very important to take care of

individuals in order to keep them in mind and to demonstrate to them that they are not forgotten. Moreover, they should be bound to and included into the team. Additionally, it is more important for a leader to take care of and maintain a relationship with employees who work flexibly and to motivate them as much as possible:

“But I believe that, especially when working mobile, it is even more important to take care of the individual. So, if you see each other all the time, if you don't see each other all the time, it's very important to talk to the individual employee or leader and also have a look at how you are doing?” (I4).

To support this, leaders may also use their own flexibility to take care of burdens of employees so they have to travel less and come to their location. Although employees are not on-site and leaders are at another location than employees, leaders can lead via video conferences individually. One interviewee pointed out that taking care of individuals is highly important because employees that have (private) worries may not be a hundred percent concentrated which may lead to accidents. So, taking care of employees individually is also a mechanism of preventing oneself as a leader but also to prevent employees from dangers:

“Because we are a family business and we help our employees not only professionally but also privately. Should an employee in private have, whether money worries or family separation or anything else, we are always there for this person. In principle, we provide them with advice and support or an apartment. Or we help them with a company loan so that they have practically no more worries. You have to imagine it is like this, the employee at the gas pump has it open, but is with his thoughts at home with his worries and an accident happens. A deflagration or an explosion. Which can happen quickly with mineral oil” (I6).

Furthermore, it is about leading employees in an individual style; sales people, for example, need a lot of freedom to be motivated. If leaders do not recognize these individual needs, they do not treat individuals individually. So, in the end the employees are more satisfied which is beneficial for both; employers and employees:

“And this is also very important, because employee satisfaction is crucial for the company to keep it running smoothly” (I6).

One major difference of leading employees who are on-site versus leading employees that work flexibly is that employees on-site as well as leaders can use their facial expressions and gestures to underline a message or even to transport it because both are physically at the same location:

“And the ones who come in here, they come in here, so how does it look like again with the family? Or you can tell by the way he comes in. I cannot see that on the phone” (I6).

According to the interviewees, this is very important when discussing difficult issues or when providing feedback, especially in performance reviews. Interacting not just verbally but also through gestures and facial expressions leads to a more complicated way of communicating because leaders have to consider several channels. This may lead to a closer/more intensive relationship between leader and employee:

“One is again the factual level, the other is the relational level. I like to have a relationship level with an employee. So, relationship level means having the feeling that I have him with me, that he is attentive. But that also costs time, that's right. That costs time, and that's why I say the other communication is more effective. But, why do I do that? Because I am human [...] I think that is something very individual” (I7).

Nowadays video conferencing software also allows both parties to see each other and therefore to see and to interpret facial expressions and gestures. However, the participants see a difference in using video conferencing systems in comparison to meeting employees in person because communication seems to be easier for them face to face since they see the whole person instead of just certain parts. In the end, it is also the responsibility of the leader to take care of the employee in terms of ensuring that the employee(s) received the message correctly with(out) using facial expressions as well as gestures and by questioning oneself:

“How does he receive this message? All these things are more likely to be perceived in a face-to-face conversation than via web or video conferencing” (I2).

4.3.2.2 Common demands on leading employees

The interviews uncovered aspects of leadership which employees who do (not) work flexibly have in common. The first aspect is that leaders in any case need a vision which they have to articulate. One interviewee explained that a vision is comparable to a guideline for employees so that they know why they are doing something. Additionally, a vision helps employees to understand why their job is making sense:

“If you do not provide the company with a clear vision and mission and the goals and values derived from it, disorientation arises in many places. It is always easy to justify it. So, you would like to give an employee something to help him or her orientate themselves. Every day, he can test himself on what he does, on the

question 'How does what I am doing contribute to the company's goals and if it doesn't, then maybe I have dealt with the wrong issues.' That's why I think a corporate vision is very, very important today, not only from the point of view of the company, but I also think that this topic is now also being demanded by younger generations of employees, with a very clear desire for the reason: 'Why do I do what I do?' And this is actually very natural" (I1).

So, visions are helpful in order to gain a deeper understanding of where a company is heading to and to provide an orientation for employees. Furthermore, it is important that the leaders / the management present the overall story of the company to the employees, so they can understand strategic decisions:

"These points are eminently important and a basic requirement. So, I need a vision, I need a goal, a set of values that everyone can align themselves with, because as a manager I often lead at a distance. And that means that everyone has to orient themselves to a vision or a direction and stick to it" (I5).

Although identifying and expressing visions affects employees who are on-site and employees who work flexibly, it is more complicated to communicate the vision to those who work flexibly as they are not sitting together in the same room and discussing the vision and objectives:

"Especially when it comes to visions, it is of course much more difficult, because I often don't get this group motivation anymore, especially in such flexible working hours. That means I cannot say, so we go now into a meeting room all together" (I12).

However, it is important that the employees understand the vision and know about the company's goals:

"They have to understand that. We also have to talk about it every day. We do" (I9).

In addition to providing and articulating a vision, being an appropriate model is also another facet of leadership which accounts for all employees whether they work flexibly or not. But being a role model also includes taking care of labor law aspects and to respect rules for collaboration:

"That would be the main exemplary function for me, that the set rules for cooperation and collaboration, are also adhered to by the supervisor himself" (I3).

Furthermore, participants agreed that there is no need to always be reachable (even as a leader), so being reachable for employees/leaders is not equated with being reachable at any time (emails do not have to be answered immediately). This underlines practically how a leader can lead by example:

“There are limits to the flexibility that a manager can claim for himself. Should she perhaps even - and here comes the role model again - use the role model to signal to an employee that it is okay not to answer emails immediately after a certain time, but to postpone them until the next day at 08:00 or so” (I3).

Leading by example can also be supported through the usage of technology. The above-mentioned aspect of sharing the calendar is one example. As a consequence, the leader in this situation also had to deal with the downsides of sharing the calendar and face the fact that employees knew about critical appointments. So, leading as an appropriate model results in a situation in which specific aspects work well without being discussed. However, as a role model it is possible to make mistakes. But then it is up to the role model to behave in this role and to discuss these mistakes:

“But a leader is also a human being. And a superior also makes mistakes. And I think that the employees must be aware of this, and this is actually a fundamental problem, which has nothing to do with home office, flexible working. I have to be a role model for the employees there, too, by showing them that I also make mistakes. I expect my employees to show me my mistakes” (I8).

Although being a role model is important for the leadership of all employees, one participant pointed out that it might be more important for those that work flexibly because they should be motivated by their leaders, although they are not at the same location at the same time. All in all, it is up to the leader to provide an appropriate and reliable role model for the employees and it is something a leader must work on:

“And this too is certainly an ideal condition. Nevertheless, it is possible to bring such a culture to life through example, through a positive image of man. But I have to exemplify it, and I have to exemplify it authentically. The more what I say differs from what I do, the more critical it becomes” (I10).

Moreover, leaders also expect other leaders to serve as a role model. So, this is not limited to the top management level, but accounts for all leaders within a company:

“So, as I have always said in my functions, I am a role model, I have always expected my managing directors or board members to be role models” (I4).

The last common feature is how leaders deal with employees. For some leaders it is extremely important to treat everyone equally:

“And I can work wherever I want, and that is not a privilege of mine alone, but every employee has that, and it goes right through from the facility manager to the board of directors, and it is all done in the same way, all equipped with the same quality” (I1).

Most of the leaders agreed on a respectful and appreciative treatment of employees (and vice versa) instead of putting them under pressure so they feel well at work and they feel recognized instead of being forgotten:

“But the thing is, if I don't ask, the employee has the feeling that I don't interest him or that his work is not appreciated enough” (I6).

“I believe that it is also important for employees not to be forgotten, according to the motto” (I2).

This also includes that employees are not only seen as a production factor with a number, but as human beings with individual feelings and moods. Moreover, it is important to communicate with different groups of employees in different manners, especially when different cultures come into play or employees struggle with language. Then leaders have to take care of that. All in all, it is helpful to deal with employees as individuals, taking care of their own strength and weaknesses:

“In other words, when I see that I have an older employee who may not be very flexible in his willingness to change, but who is an ace in his field. And then I see the bottom line for the company. Then I integrate him differently and give them much more freedom” (I10).

Furthermore, mistakes can happen on the part of employees. However, leaders should be aware of this possibility and understand that it is not preventable. So, both must be able to deal with it:

“An employee must be able to cope with this, just as the manager must be able to cope with the fact that employees make mistakes. That is cooperation, that is people” (I3).

4.3.3 Trust

Trusting employees is a major component of working flexibly as the possibility to control them is limited. But this is not the only direction. Employees have to trust their leaders as well which is fundamental to ensuring that employees can work where and when they want to:

“In other words, interaction of the trust level to make the location freely selectable and to make the working time freely selectable under the same conditions” (I1).

If leaders do not trust their employees, it is more logical to establish a strong level of control than to provide flexible working conditions. Moreover, if the employees seem not to fit into the company or the team, leaders try to solve it through communication or by ending employment contracts. Trust is a basic requirement of working together:

“First of all, trust is a basic prerequisite for cooperation in general” (I10).

“But basically, I believe that as a manager you have to be able to trust your employees, otherwise you have the wrong employees on board” (I3).

Nevertheless, trust can be misused as well, so that leaders may be disappointed by their employees. Due to this, trusting employees is the foundation for flexible work and an elementary aspect of leadership:

“Of course, you have to trust the employees. So, leadership must be based on trust” (I2).

This is needed because leaders have less opportunities to control their employees since they work at different times and/or locations. However, trust should always be a concern, regardless of whether employees work flexibly or not. Furthermore, it is up to the leaders to give trust to employees first before employees pay it back:

“You give it first, as a manager, the trust, and then get it back and not vice versa” (I4).

In addition, it cannot only be a one-off occurrence. Every member of the team has to work on maintaining and keeping trust:

“So, it is a valuable asset. It is an asset that must be defended and acquired again and again from all sides” (I10).

However, there are also examples of leaders not trusting employees and vice versa. One leader provided an example where employees are not allowed to work from home on Mondays or Fridays since this does not imply work but a longer weekend:

“I have the example of an energy company where employees are not allowed to work from the home office on Monday and Friday because it is a long weekend, says the manager. So, there's the assumption that no work is done” (I5).

Another example shows that misusing trust is not only related to flexible work:

“If you didn't find him, you have to go to the warehouse where the insulation was, then he might have had to sleep for half an hour. I can't control that either. If I have a large warehouse, then somebody can get lost” (I11).

Trust is more than just a requirement. It is a starting point for employees from which they can take on challenging tasks, make mistakes and perform well. So, the overall aim is not only to build up trust, but to use trust as a foundation for achieving the set goals. However, some leaders are struggling with giving trust:

“How much trust do I have in the employee? That he can do his job even without knowing that I could show up at any time, a result that could be seen, that he will continue working anyway. That is very, very, very difficult. I think you have to have a much higher level of trust in employees” (I12).

Interviewee 5 sums it up: “So, mobile working is not possible without trust”.

This leads to the possibility that there may be trust on the one hand but control on the other, which is somewhat contradictory because leaders want to trust but also need control. High levels of control may lead to lower levels of trust. This control is typically achieved via measurable results through preliminarily defined aims:

“It is also important for every employee to be able to prove work results, yes. This is done through measurable results” (I2).

In general, leaders assume that employees are working for them because these employees want to perform which leads to less control. So, leadership is rather built on trust than on control when working flexibly. However, leaders want to have the opportunity to check whether or not employees worked satisfactorily:

“Yes, so what I don't think works is this model command and control. The essential aspect is trust, the combination between trust and at certain points already checking

possibilities, so checking in the sense that if the result of the work is really delivered” (I4).

So, leaders do not want to supervise every single step, but they want to control (intermediate) results or milestones to prove that employees make progress and leaders can intervene if necessary, although leaders trust their employees. Therefore, it is more about setting the framework, but not calling employees every morning and monitoring if they are working:

“So, of course I can call you every morning, are you already sitting at work? I can monitor via webcam. That is no problem. Or talk about it every day, okay, how many hours did you work today? But that is not trust” (I5).

The issue of control is supported by transparent technology because it enables leaders to monitor everything, since everything is made transparent by employees. Controlling employees is necessary since mistakes can be made so everyone can learn from them and to appreciate employees for tasks that have been well done. In some industries the law also requires controlling employees if their job is very dangerous like working with mineral oil which could lead to death:

“If anything happens, then we immediately have fatal accidents through explosions, through deflagration. Accordingly, control is a very big factor for us” (I6).

However, some employees also do not trust their employees and therefore test if they are really working which underlines a strong need for controlling employees:

“I can test this quite well. Sometimes I even test it” (I9).

All in all, most leaders try to give as much trust as possible, but also want to control milestones or (intermediate) results of their employees.

For employers it is important that employees trust each other. So, employees must know (or have trust in) that their colleagues work as hard as they do in order to achieve the goals. This trustful environment then leads to a good working climate and to a good performance:

“This is very, very important so that we can achieve a good overall performance and also have a good working atmosphere among ourselves” (I7).

If employees face a situation of distrust among employees this can be a burden. It could lead to situations in which employees think that their co-workers do not work:

“Yes, he is already back in his home office, or he was not available again just now. He's probably still sitting on the sofa or lying in bed” (I5).

“And I have the impression that my former office neighbor has a quiet life there” (I3).

These situations can appear because employees do not see each other every day and therefore cannot be certain their colleagues are working. This is something that should not happen within a team and it is up to the leaders to circumvent negative occurrences like these. Moreover, distrust can have a negative impact on employee satisfaction, which might even be noticed by customers. Therefore, trust among employees is understood as a basic component, especially if employees work together in dangerous work environments, which could lead to health restrictions or even death. This trustful environment among staff can also be created by employees based on their social competencies which is even more complicated to gain if they work flexibly:

“There, even more high social competence is required, and social competence has something to do with trust” (I8).

So, leaders have to create a trustful environment in which employees have confidence in each other:

“And just as I must have this basis of trust from top to bottom, if I may exaggerate, and from bottom to top, I must also have it horizontally, otherwise the whole thing won't work” (I10).

Therefore, leaders use trust-building activities like team workshops or events that are planned by employees and supported by their employers to identify with the company as well as with their colleagues:

“We just try to have certain things in common, like having an event twice a year somewhere where people talk to each other, sometimes outside the company, sometimes together. Or, if the employees themselves are planning something, we support it in order to get the ‘we’ feeling” (I6).

Moreover, leaders offer a certain degree of freedom to employees up to which they can work on their relationships (e.g., via virtual meetings) as well:

“I have to give the team the freedom to meet there for a virtual chat. Just to talk about things that are not necessarily relevant to work” (I8).

If trust-building activities like these are not being implemented, trust may decline since leaders and/or employees question themselves if another person is really working which underlines an eroding trust-level. This is why it is so important to keep up trust within a (flexible)

workforce. Another way of maintaining it may be small talk. This has to be initiated actively by leaders since the workforce is not located at the same geographical area, which comes in line with the additional time required for leadership. However, trust-building activities are very important to build or to keep up a high level of trust:

“Once a year I and my team, whether they were managers or employees which I led as well, so, I said, once a year we take that time. And that is a piece of working together on topics. But it is also a piece of having fun. Fun is completely underestimated. But it is also a piece of confidence-building measures” (I4).

So, it is up to the leaders to create and maintain a trustful working environment.

4.3.4 Managing a flexible workforce

The interviews uncovered that a flexible workforce must not only be led, but also managed. Since leadership focuses on interacting with employees, like building a team, having employees committed to the vision etc., management concentrates on organizational tasks of leaders, like having the right people at the right place. It is important that the right people are able to use the right technology. If this is not the case, they have to be trained to do so. Moreover, they have to work in a self-organized manner. Therefore, employees have to be recruited that are capable of these competences or they have to be trained in this regard (i.e., acquisition of human capital, or employees/human capital should be developed). In terms of training employees, it is necessary that either the employees identify the need for it or their leader has to recognize it. In both cases, the two parties have to agree on the need for training.

Moreover, collaboration and communication should be fostered when managing a flexible workforce. This means creating a good team spirit which leads to a good atmosphere, being sensitive in relation to communication style and implementing and using communication rules as well as ensuring informal communication.

4.3.4.1 Acquisition and development of human capital

One essential requirement for flexible working is the recruitment of the right people since they have to fit in an organization with its values and its flexible structures. So, they need to have skills that enable them to work flexibly, for instance staying focused or being self-disciplined. In order to gain the relevant information about applicants, it could be beneficial to implement trial workdays, an intern or an assessment center within the recruitment process:

“You can do it very easily if you do trial work days or something similar to see if something is basically right and fits” (I11).

Even if the recruitment process is time consuming, it is beneficial because it will probably result in a successful working relationship:

“But if I make the effort I put into the selection process, it pays off completely in something like mobile working, because then I also say okay, I have checked, checked and got a feeling for a lot of things in the selection process. And that is not a hundred percent certainty. But the probability that this time investment will pay off later in the collaboration is very high” (I4).

But it is not only up to the (potential) employer to evaluate whether an applicant may fit in the organization but also up to the applicant and/or the employee to question themselves. Moreover, it is also about having/recruiting the right leaders because they have to be capable of dealing with a situation of high flexibility, especially in terms of leading employees and feeling responsible for them when they work flexibly:

“So, I need managers, and these managers must be able to do that, even if my employee works at home, I am responsible for him. That means I have to live up to this responsibility and have to think about how I live it. Do I have a meeting every morning? How do I communicate with the employees and so on and so forth” (I8).

Since leaders are often not prepared to lead employees that work flexibly, they – as well as employees that have a lack of knowledge – have to be trained:

“You have to train the managers in how to deal with flexible and location-independent work” (I12).

It is important to have leaders and employees that are up-to-date in the usage of technology because this may prevent problems in communication so that people can reach out to all other recipients. With reference to communication, it is furthermore necessary that leaders check (and know how to do so) if employees are currently working which can be achieved through the usage of a specific software before they call them. In addition, it is important that everyone knows how virtual communication works, meaning that people have to be aware of using their hands to display gestures when talking in a video conference because this may underline a statement or ridicule it. Moreover, they have to learn not to interrupt speakers:

“How do they gesticulate, or rather, how do they let themselves be talked out of it? I think that's something that people, especially in the first time here, had to learn a lot to let the other one finish” (I8).

Furthermore, leaders have to train their employees to be capable of communicating in the right software/using the right channel so that not only the leader is informed but the whole project team, respectively every important person. Since training in the use of technology is time consuming, it is important to implement them before a company implements flexible working arrangements so leaders and employees are prepared. Interviewee 12 sums the relevance of trainings up and states:

“That you need to have training in the company accordingly [...] for the leader in particular, so that he/she learns to deal with it and to train the employee in the application of the technology”.

Since employees may not be located within the company's premises or may work at times when the leaders do not work, it is very important that these employees are able to organize themselves within given frameworks with specific rules (like which hotel category may be booked when employees travel) in order to perform well. Besides the self-organization of employees and of the team, some leaders require an overlap when and where they can get in touch with employees and/or teams which somehow counteracts the aspect of flexible work in terms of flexitime and flexible workplaces. In addition, leaders rely on this self-organization:

“In my view, control is not necessary if we have a strong self-organization” (I5).

Self-organization leads to employees communicating early and independently about what has (not) been done that day. However, when talking about self-organization of employees that work flexibly it is important that set goals are achieved, not by setting a deadline which is too short, but rather a longer one (e.g., one day) because employers do not know when employees will work:

“Working hours are not necessarily the most important factor. But it depends on the successive clean handling. It doesn't have to be ready at eight o'clock, but it should at least be finished that day” (I6).

Furthermore, this is a matter of give and take; employers give the flexibility that allows employees to arrange their work in a location and time which is best for them, while employees pay them back with reliability and satisfaction. Interviewee 12 provides a managerial

example in which payroll accountants work during the day, then take care of their children, and then go back to work again. This would not be possible without WFPs because on the one hand the flexitime would not allow such a procedure and on the other because employees do not typically go to work in the evening/at night:

“They said, I work until 3 p.m. then I take care of my family and at 8 p.m., when my children are in bed, I work another two hours. You would have never received these two hours from the employees. Because they wouldn't have been physically able to be there and wouldn't have had the technical requirements to be able to work from home” (I12).

All in all, it is important to have and to acquire the right employees with the necessary human capital or it has to be developed by the employers in order to set the foundation for a high-performance workforce.

4.3.4.2 Fostering collaboration and communication

Employees have to apply their social skills and work together as a team. Therefore, it is important to make every person feel included in the team even though they are not physically present, in order to strengthen the team and to ensure employees are not forgotten:

“They are still at work and are just as much a part of the department as the colleagues who are just here on-site, yes. And for me, that's always the maxim, to treat everyone equally” (I2).

So, it is – also but not only – up to the leaders to foster collaboration as well as to form a team which works together on set goals:

“You have to take countermeasures accordingly. Here, too, you have to try to strengthen the trust among each other, so that you feel and function as a team, even if you work separately” (I3).

Working together with other people who are in a bad mood or are not empathic leads to disharmonies within a team which results in bad or even no results. Therefore, it is important to ensure that communication takes place within the team and that (interim) results are noted. Besides, it is more enjoyable to work with friendly people than with bad-tempered ones. A good climate can additionally help to be a buffer for (external) pressure:

“If you have a good working atmosphere and if you trust each other, then I have often experienced in my daily work that when pressure from outside comes in, it is not always easy. You can then bear it better as a team” (I7).

With teamwork, companies are also not dependent on individual employees because the team achieves results together. However, people are human beings and generally able to cooperate:

“They are not just a resource, but also people you enjoy working with” (I4).

If employees work flexibly, a sensitivity for communication style and rules is necessary. Some leaders ask for a time overlap so they can directly communicate with their employees. An illustrative example is that employees work at night and leaders work at day, so they can only communicate asynchronously. This gets more complicated if people work in different time zones:

“My boss was sitting in Dallas. I spent the evening with him and I was responsible for the Middle East and Russia, so at seven in the morning I started talking to the Russians. But we always had an overlap somewhere” (I4).

Moreover, it is up to the leaders to take care of the flexibility given to employees. Therefore, leaders have to make sure that an employee is currently working before calling. In addition, leaders have to be aware that employees are not available all day long due to the flexibility. The employees can also have private appointments during the day. This leads to a situation in which leaders and employees have to make appointments to communicate with each other or rely on a call back for instance:

“What if I need to reach you? Because somehow, I have a question, or a customer calls. When and how can you be reached? How fast can you call back if you are not reachable because you are on the toilet or have to take out the garbage. That's just part of the everyday work routine. I also get myself some coffee or go to the toilet or canteen. That's quite normal in the office or at home” (I5).

So, it is also up to the leader to get used to different working times of employees, e.g., parents are working in the evening or in the morning when children are in the kindergarten. However, the customer satisfaction can be increased if employees of a company work or react to a customer's problem at unusual times (like early in the morning at 5:00 or 06:00 a.m.):

“Thus, of course, we have received a high level of customer satisfaction, because we were able to help quickly, even at times that are not normally working hours for ordinary people” (I6).

Other interviewees have a different point of view and dislikes flexitime in order to maintain working and resting times. This is also understood as a protective mechanism so employees

do not need to be reachable 24 hours a day. The management board excludes themselves from this reachability policy. As they are the owners of the company, they want to keep it running and they want to show their employees that they are always the first people in the office and the last ones who leave it. Nevertheless, employees also express their appreciation by not getting in touch with the management board outside regular office hours without having discussed it beforehand, because the management board respects the working hours of their employees as well:

“The added value is that the employee feels, I'll say it negatively, he doesn't feel exploited, but he sees Oh, my employer respects my need for rest. He respects me as a person, and he promotes my rest by simply leaving me alone. And this 24-hour availability - that's something I don't want in the company” (I7).

Companies allow employees to work in flexitime if the job can be done at any time and in order to bind these people to the company:

“We also need her because she has a certain know-how and also works well and the working time as such also allows it” (I11).

But leaders also know that it is important to care about their employees in order to ensure that they do not overwork themselves and lose connection to their families.

Another major aspect of virtual communication is that leaders as well as employees must be highly sensible with regard to their communication style and the communication rules (in this regard the focus lies on using it, while the focus in the chapter on acquisition and development of human capital was on learning how to use technology for communicating). So, it is up to everyone to formulate aspects clearly and transparently – and if necessary – to write them up. Furthermore, a respectful and friendly treatment is desired in any case even in case of a conflict. In addition, every spoken (or written) word should be binding so that leaders and employees can rely on each other. This also leads to a situation in which they have to be capable of communicating with the right software/using the right channel that not only the leader is informed but the whole project team respectively every important employee. This is a challenge for leaders as well as for employees which leads to mistakes in communication. Moreover, it is important that the other party, either the leader or the employee, returns any missed calls. Furthermore, it is important that employees raise their hands if they have a problem as employees must provide feedback to their leaders in this regard:

“So, I have to keep signaling to my employees: ‘Dear employee, if you don't know what to do, raise your hand and say I don't know what to do’. Otherwise, it won't work. That means I have to talk to my employees a lot as a leader” (I8).

When messages are communicated via video conferencing it is easier for leaders (in comparison to telephone calls) since they do not only have to concentrate on their voices and expressions, but can also use facial expressions and gestures. But in this regard, it is important to make sure that these gestures or facial expressions are visible. If this is not the case and, for instance, the hands are not visible during the video conference and a leader makes a movement that makes a joke out of what has been said the message may be misinterpreted. An interviewee said:

“So, if I am joking around somewhere now, or if I say something rather sarcastically, I may have to articulate with my hands up here than I do down here. Because you do not get all that. That means I can insult someone if he does not see his hands” (I8).

So, a defensive attitude is probably not visible because one cannot see that the other has crossed his arms (German understanding of expressing a defensive attitude). Leaders must be aware of how their choice of words and their behavior affects the employees:

“You need to talk to people in a much more structured way. You have to choose your words much more because you cannot underline them with a smile or a grim expression or with hands and so on. Especially when you are on the phone, it is very important that you choose your words in a very different way. Choose much more carefully. So much more difficult” (I12).

Informal communication (not associated with work) takes place either on a personal basis or in a virtual environment. If the workforce operates flexibly virtual informal communication has then to be supported by technology, if for instance virtual kitchens for employees are set up in order to talk about private aspects. And the leader has to communicate to the team that they have the freedom to talk about informal aspects as well:

“I have to give the team the freedom to meet there for a virtual chat. Just to talk about things that are not necessarily relevant to work” (I8).

Leaders have to take additional time for this informal communication, because it does not happen spontaneously since leaders and employees do not meet within the facilities of a company, but virtually via email or telephone. Other leaders also establish additional

meetings which are reserved for informal discussions only, such as having a virtual beer or wine tasting or a virtual quiz:

“Yes, sometimes, as we have done now in the merger, we simply have a digital wine or beer tasting in the evening or a digital quiz evening to create the social closeness that I might not be able to do because I do not have the opportunity to meet. So, I have no room. I have to try to create it digitally” (I5).

Virtual meetings like these have the potential to function as a social glue within a team. Therefore, informal communication is essential and leaders or employees have to set up a virtual room for informal communication if this is not possible in a personal way. In some situations – e.g., if employees work from home – informal communication arises spontaneously when, for instance, children suddenly appear in front of the camera and leaders end up talking to them. This is something leaders view positively as a connection between them and their employees' families helps to retain staff:

“The mothers also sometimes have the child with them. That also comes running into the screens from time to time. So, it can also happen that you talk to these children. You have a completely different relationship to the family, especially often to the children, because you know them much better” (I8).

However, some leaders do not take this additional amount of time because they think that it would be too complicated to arrange and/or moderate an informal discussion within a virtual team meeting:

“You can't stand it when you have a team meeting via Zoom and then you start to talk informally. That's when they get crazy. Because only one person can talk at a time. And he can't say, oh it's great weather today. No, that doesn't work” (I4).

It is difficult for leaders to paint a picture about what is going on with employees only via telephone calls, so informal communication is reduced. If teams work flexibly to a large degree, leaders implement personal informal meetings to be able to talk about private issues and to make use of this social glue:

“Or if you say, okay, it's summer, we'll go and have a barbecue. But then it's more social than making a business meeting” (I8).

However, not communicating about informal aspects could end up in a situation in which employees do not feel appreciated and socially isolated. This is why it is important to maintain and to ensure the informal communication flow – either personal or virtual.

4.4 Discussion of the results and revision of the initial conceptual framework

The research objectives of this qualitative study were to firstly identify influencing factors of flexible workplaces on company performance with respect to employers, employees and the socio-technological environment (cf. RO2) and secondly to develop a causal model based on the gathered knowledge (cf. RO3). Third, qualitative research also contributes to RO4, as this provides a basis for item development (cf. chapter 5.1.1).

The qualitative study highlights that transformational leadership is – due to its characteristics – a suitable style for leading employees that work flexibly in SMEs which also enhances trust. This is in line with existing knowledge, cf. Podsakoff et al. (1990). Therefore, transformational leadership has been explored as an antecedent construct of internal numerical flexibility (i.e., working flexibly) and trust. This study underlines that transformational leadership is an appropriate way of leading employees that work flexibly, because the key behaviors established by Podsakoff et al. (1990) have been described by the interviewees. Leaders have to be a role model, to provide a vision and to set up goals which employees will follow or strive to achieve because these are the overall guidelines for employees when they do not meet their leaders regularly in person. However, leaders should deal with employees individually because they may have different beliefs, values or attitudes, again coming in line with Podsakoff et al. (1990). This aspect has been discussed by interviewees since there may be employees having problems with modern technology. However, this indicates a need for developing these employees instead of firing or punishing them for not knowing how to handle ICT. According to Bass (1985), this individual treatment is a major aspect of transformational leadership. Interviewees assume that employees are intrinsically motivated and willing to do the best for the company which supports Bass' statement that employees are willing to exceed expectations. Leaders provide freedom to employees on where and when they do their job but define goals which they have to achieve. Therefore, they are challenging their employees as a matter of intellectual stimulation and imply high performance expectations, two other key behaviors described by Podsakoff et al. (1990). Moreover, working together as a team is also an important aspect of transformational leadership (Podsakoff et al., 1990). In this case it is also relevant as employees do not meet their colleagues (regularly), so leaders have to enable them to work as a team and to support each other, which increases trust and avoids isolation/feeling left out. These aspects fit very well to the described transformational leadership behaviors from Podsakoff et al. (1990) which underlines that transformational leadership is an appropriate style of leading employees that

work flexibly in SMEs. So, the literature on describing transformational leadership behavior has been confirmed and transformational leadership can also be applied in flexible work settings. However, the interviews highlighted that leaders have explicitly to take time to lead their employees since they do not meet them at random. Under the circumstances of working flexibly, leaders have to explicitly concentrate on leading their employees at predefined places (e.g., virtual environment via video meeting) and times. This is not the case, if leaders and employees regularly meet in the company's facilities, because employees are then led in occasional meetings. Therefore, explicitly taking time for leadership should be a relevant part transformational leadership when working flexibly, constituting a development of transformational leadership theory.

In addition, this case study uncovered that even transformational leadership can fail, if technological aspects of virtual leadership are not applied (well), as this causes interrupted communication flows, which has been discussed in a variety of contexts in the literature (Chen et al., 2021; Cowan, 2014; Darics, 2020; Hou, 2020; Sharpp et al., 2019). Moreover, it causes misunderstandings due to which virtual communication is affected by invisible facial expressions and gestures. However, the application of technology has positive aspects as well. This is the case when requirements (like high-quality equipment) are sufficiently fulfilled, enabling employees (and leaders) to work flexibly, as already outlined by Kingma (2016). Thus, a long-term, dynamic and expensive investment in ICT is essential for SMEs as they face challenges and changes globally (Eze and Chinedu-Eze, 2018). Therefore, leaders must be able to use innovative technological instruments and methods (Oberer and Erkollar, 2018).

Current literature focuses on only a few technological aspects like communication apprehension and text-based communication ability (Charlier et al., 2016), instead of the big picture, i.e., compilation of technology, which has been uncovered in this study as important. However, the combination of technological aspects can support or hinder leadership, as pointed out by the interviewees. So, it is not only up to one or two specific aspects, but rather the combination, respectively the availability and usage of a composed set of technology. Thus, leaders (but also employees) must be aware of the available technology and use it appropriately in order to communicate the message via the correct technology. This influences leadership because communication flows can break and messages can be misinterpreted or misunderstood due to leaders and employees not seeing each other. Therefore, it is important that leaders must know how to reach out to their employees and to ensure that they

– although the communication is mediated by technology – understand each message appropriately.

Trust has been explored as a foundation for working flexibly as employees cannot be controlled or observed easily. Therefore, if there is a low level of trust, it will lead to low levels of flexible work. In this vein, leaders highlight that they care about trust in terms of trust-building activities that take place together with employees in a virtual (or analog) setting, since trust is a destructible and vulnerable construct which has to be maintained. However, these trust-building activities will only lead to success if leaders trust their employees, i.e., they expect that they are working in third workspaces on Mondays or Fridays instead of implying them having a longer weekend. Transformational leadership enhances trust which has been underlined by the interviewees with a focus on flexible work as well as by other recent studies (Braun et al., 2013; Jena et al., 2018).

Moreover, trust has to be established and maintained by employees as well, as they have to trust their co-workers instead of suspecting them to be in bed or doing household tasks when they should be working. Trusting each other is important because employees do not see their co-workers in the facilities of the company either. Therefore, the findings from this study are on the one hand in line with current research studies (Crisp and Jarvenpaa, 2013; Moser and Axtell, 2013; Nordbäck et al., 2017). On the other hand, this study's results highlight trust as a multifaceted construct which is not reduced to the relationship between leaders and employees, but also includes the relationship among employees, leading to a situation in which trust-building activities must be used wisely by leaders to build up and maintain it. Furthermore, this study uncovered that, in contrast to Rocco (1998), the appropriate use of high-quality technical equipment (e.g., webcams) increases trust because visual and verbal guidance are no longer missing (trained users (managers and employees) are a prerequisite for avoiding miscommunication). This in turn coincides with the required ICT investments for SMEs.

Derived from the data of this study, the construct managing a flexible workforce was incorporated in the revised conceptual framework. This accounts for recruiting or already having and developing needed human capital, “or the knowledge, skills, and abilities of individuals” (Kang and Snell, 2009, p. 68) since both – leaders and employees – have to be able to use ICT properly. If this is not the case, e.g., employees are not trained well, messages from leaders cannot be read or employees overlook a message as they received it via a chat, which they are not using, but rather communicate via email (the multitude of communication channels is a challenge). This can appear in asynchronous communication in general. In addition,

employees might not know how to behave in a virtual meeting, so communication is unclear and not free of misunderstandings, which ultimately not only impedes leadership, but can also be counterproductive when it comes to allowing employees to work flexibly. It can also create misunderstandings among employees, which diminishes trust among the workforce. The interviews showed that for working flexibly employees must be able to use technology as well as to organize themselves. If new employees are to be recruited these aspects should be taken care of. If current employees are not capable of using technology or organizing themselves, they should be trained in doing so because the right knowledge, skills and abilities of a workforce have an impact on the performance of a company as shown by Ployhart et al. (2011). This underlines why having skilled employees within a workforce is highly important. In summary, competences must either be present or developed (Jiang et al., 2012), as they are a prerequisite for flexible working.

Additionally, collaboration and communication should be cultivated when managing a flexible workforce. These aspects are antecedents of social capital which is defined as “the knowledge embedded in and available through relational networks among employees, provides a conduit for knowledge exchange and combination within the organization” (Kang and Snell, 2009, p. 68). This is why a good team spirit with a good working atmosphere should be created and maintained. Moreover, informal communication, e.g., in a virtual canteen, can increase interpersonal relationships between employees, which again supports the exchange of knowledge within a workforce. This has to be organized since employees do not see their colleagues on a regular basis, so informal communication has to take place virtually. Positive work environments foster productive behaviors, so leaders need to guide their workforce by organizing team events and demonstrating to their employees that they are encouraged to communicate informally, even during work hours. The interviews showed that these aspects should be ensured by leaders and worked on by the whole team so that the work environment is supportive and enables productive behavior. Therefore, the aspect of managing a flexible workforce is included as an additional construct into the revised conceptual framework. Either a new scale has to be developed for this construct, or it might be possible to use the constructs of human and social capital.

According to DRQ1, transformational leadership provides a vision and focuses on teamwork and leaders who serve as role models. It sets goals, stimulates employees and expects a lot while also taking care of every individual. It influences internal numerical flexibility since a transformational leadership style is supporting employees although they are not on-site or have different working times due to enabling employees to autonomously decide where and

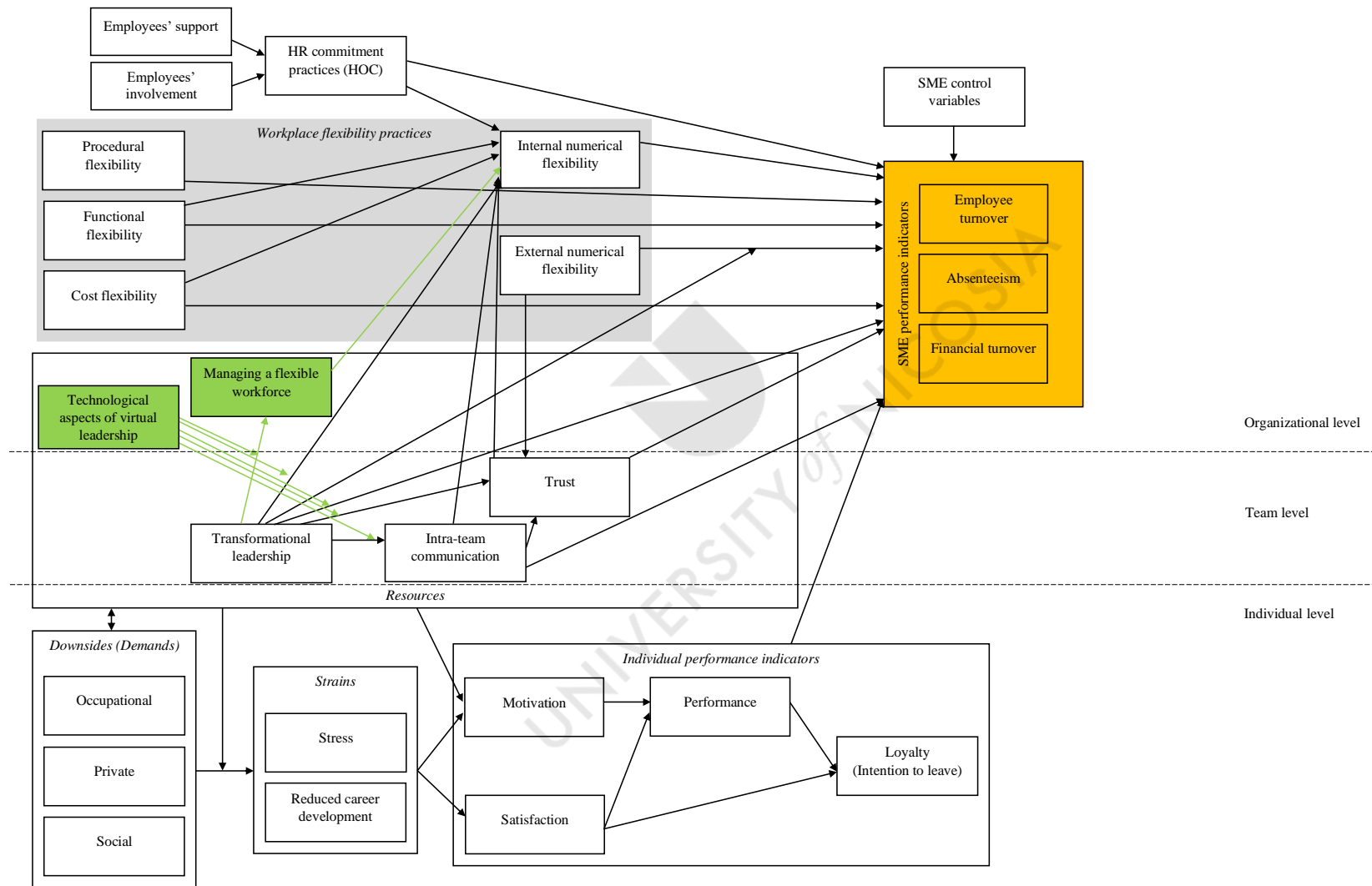
when to work in order to achieve goals (as a team or an individual). Moreover, it is crucial for leaders to take their time to actually lead flexibly working employees as this does not happen randomly, like it does when people are based in the same office. Transformational leadership also enhances trust between leaders and employees as well as among employees (e.g., via the usage of team-building activities) which answers DRQ2. Finally, and with reference to DRQ3, ICT is needed when employees are led since this enables both parties to communicate with each other and has the power to support or hinder leadership, which results in ICT being a crucial aspect. The interviews and thus this qualitative study have identified ICT as a paramount success factor for the leading of flexibly working employees, which was previously not recognized in other studies.

4.5 Conclusion: Necessary adjustments of the initial conceptual framework

Finally, based on RO3 (development of a causal model), the initial conceptual framework is revised in this chapter. After researching managing directors, heads of HR and consultants by following the research questions and the DRQs, transformational leadership is confirmed as a suitable leadership style when employees are working flexibly. But there are also technological aspects that influence leadership positively or negatively. Moreover, trust in the relationship between leaders and employees as well as among employees was uncovered as an important factor. In addition, the concept of managing a flexible workforce occurred. Therefore, based on the theoretical contributions, a revised conceptual framework is necessary because technology as well as managing a flexible workforce are new relevant constructs. These have not been in the focus of existing literature so far. According to Jabareen (2009), conceptual frameworks can be reworked if new data indicates a modification since these are non-static frameworks. The conducted qualitative case study uncovered the aforementioned aspects, so new data (here: the data structure of the qualitative study, cf. figure 4.1) reveals a need to modify the *initial conceptual framework of workplace flexibility practices, transformational leadership, trust and intra-team communication on SME performance indicators* (cf. figure 4.2). The *conceptual framework of workplace flexibility practices, transformational leadership, trust and intra-team communication on SME performance indicators* is enhanced by the two constructs of technological aspects of virtual leadership as well as by managing a flexible workforce (revisions highlighted in green).

Figure 4.2: Revised conceptual framework of workplace flexibility practices, transformational leadership, trust and intra-team communication on SME performance indicators

Own depiction



HOC = Higher order construct

The results reveal that in SMEs it is highly important to be well equipped with ICT and well trained in using it, since technological aspects of virtual leadership can either hinder or support transformational leadership of employees that work flexibly. Due to this balance of supporting or hindering, a moderating effect of technological aspects of virtual leadership on the relationships between transformational leadership and internal numerical flexibility, trust as well as managing a flexible workforce, as depicted in figure 4.2, is assumed. This moderating effect is expected to strengthen (or weaken) the nexus between transformational leadership and the dependent variables. Therefore, these moderating effects need to be explained by further quantitative studies. Furthermore, leadership is a time-consuming and complex task when leading employees who work flexibly and leaders must be qualified as they use innovative technology for their leadership. However, transformational leadership is an appropriate and trust enhancing style of leading employees that work flexibly in SMEs.

In addition, in SMEs a flexible workforce must be managed (organizational tasks), which has been derived from this study's data as well. This has been included as an additional construct in the revised conceptual framework. The construct managing a flexible workforce is incorporated as a mediating variable between transformational leadership as well as internal numerical flexibility and contains human capital as well as social capital. This construct is included as a mediating construct because it can, for instance, be operationalized by facilitating informal communication, e.g., by virtual team events or having lunch together in a virtual canteen. The requirement for such behaviors is a leader who focuses on a good team spirit, like transformational leaders do. Moreover, managing a flexible workforce is an antecedent of internal numerical flexibility as good management of flexibly working employees will probably enhance the number of employees working flexibly since the environment and the embeddedness in the team is present.

One additional aspect was raised by the interviewees concerning performance measurement. In general, the interviewees agreed on having indicators which measure performance, such as employee turnover. However, the interviewees have recommended examining performance from multiple perspectives rather than just three metrics. They mentioned, for instance, more efficient processes, productivity or capacity utilization due to customer orders. In addition, financial turnover (sales) is regarded critically as sales could be high but company profit could be low:

“For me, sales are not a performance indicator. So, it's nice if we make a lot of sales, but make a loss. For me, profit should be listed here. A company is there to make

profit, not to make sales. I'd rather have a company with one million sales and 500000 profit than with 10 million sales and 500000 minus" (I5).

As a consequence, the performance indicators are highlighted in orange, indicating a need for revision. Thus, they will be reviewed critically when determining the measures for the quantitative model (cf. chapter 5.2.2.1.1).

Both managerial and theoretical insights into the crucial roles of ICT and trust in the leadership of employees who work flexibly were uncovered, and the identified gap was addressed by presenting how ICT, leadership, and trust interrelate and influence internal numerical flexibility. A revised conceptual framework was also presented depicting the expected relationships among the (new) constructs. The topic of flexible working in one of the three workspaces (included here in internal numerical flexibility) is currently being discussed along with its positive and negative facets in companies (SMEs and larger companies alike), triggered by the COVID-19 pandemic, and so another important aspect relating to this trend was analyzed in this study and theoretical as well as managerial insights have been presented. This chapter closes with the conclusion from I12 who stated concerning working flexibly: "It is a highly relevant topic, and I believe it will change the world of work in a sustainable way".

CHAPTER 5 SCALE DEVELOPMENT AND QUANTITATIVE SURVEY

5.0 Introduction

After conducting a qualitative study, a quantitative study will now follow as the second part of a mixed methods research approach. As with the previous study, this will adhere to a critical realist philosophy. This will have the ability to include the advantages of both quantitative and qualitative research, while also overcoming the disadvantages of both (Abutabenjeh and Jaradat, 2018; Babbie, 2010). Quantitative research is typically used to explain certain relationships and to generalize findings, if the sample allows the researcher to do so (Field, 2018). There are several ways how quantitative research might be conducted, such as archival, documentary, case study, experimenting or survey research (Saunders et al., 2016). This quantitative study will be a survey research, meaning that “data are collected predominantly by self-administered questionnaire [...] on a sample of cases drawn from a wider population at a single point in time in order to collect a body of quantitative or quantifiable data in connection with a number of variables, which are then examined to detect pattern of relationships between variables” (Bryman, 2016, pp. 696-697). Regarding the time horizon, this study will be a cross-sectional one as the current situation represents the focal point of interest (Bryman, 2016; David and Sutton, 2011; Saunders et al., 2016). Moreover, cross-sectional research does not interfere with what is observed, as for instance in an experimental research design (Field, 2018). It is comparable to snapshotting variables at a specific point of time, uncovering potential statistical correlations but not causality (longitudinal studies enable causal interpretations) (Field, 2018). However, cross-sectional research in HRM has been in use for many years (e.g., Ehrnrooth et al., 2020; Huselid, 1995; Lepak and Snell, 2002), which indicates the acceptability of this time horizon. This study will be cross-sectional, as the actual situation of leaders will be analyzed. Nevertheless, it is possible to repeat the analysis after a certain period of time, so that a longitudinal design is conceivable in principle which finally allows causal inferences to be drawn. Typically, quantitative research follows a deductive approach in which predefined hypotheses are being tested (Jonker and Pennink, 2010; Saunders et al., 2016; Tashakkori and Teddlie, 2008). This approach will be applied later in this chapter when structural equation modeling is being used.

The aim of this quantitative stage is – as it was in the qualitative stage – to contribute to the answer of the research questions, achieving the research aim as well as the research objectives. According to the grand design (cf. table 1.1), especially RQ3 as well as RO3 (developing a causal model explaining the nature of the factors’ relationship such as moderating/mediating effects and the intensity and direction) and RO4 (developing a new scale containing technological aspects of leading flexibly working employees) are associated with this

quantitative stage. The hypotheses which are mentioned in the grand design will be developed and discussed later on in chapter 5.2.1. Since this study is conducted under the epistemology (as a part of the research philosophy) of critical realism, the RQs, ROs and the aim will be evaluated not only from a qualitative perspective but additionally from a quantitative viewpoint to cope the limited access to reality (Zachariadis et al., 2013).

Since the qualitative case study uncovered a need for developing a new scale (cf. chapter 4.5), the multi-method scale development procedure will firstly be explained in this chapter. This chapter includes a brief introduction and a multi-method procedure for scale development, item development, concluding with a new and validated scale on *Technological requirements of virtual leadership (TRVL)*. Finally, the new scale will be used as one construct in the conceptual framework which has been initially and further developed during this mixed methods study. The conceptual framework will be analyzed by applied survey research, so a questionnaire will be sent out as a source for primary data for analyzing the causal model using structural equation modeling.

5.1 Multi-method scale development procedure

The case study (cf. chapter 4) uncovered and highlighted the relevance of technology when leading employees that work flexibly since these aspects may hinder or foster leadership. The leaders discussed various technological aspects like IT infrastructure, including devices and networks as well as software for video conferencing or document exchange. However, this seemed to be an incomplete picture because the leaders often provided examples to underline their statements. As a consequence, the aspects of using ICT as well as being skilled in using ICT have been researched further, because these elements are critical for the quantitative analysis.

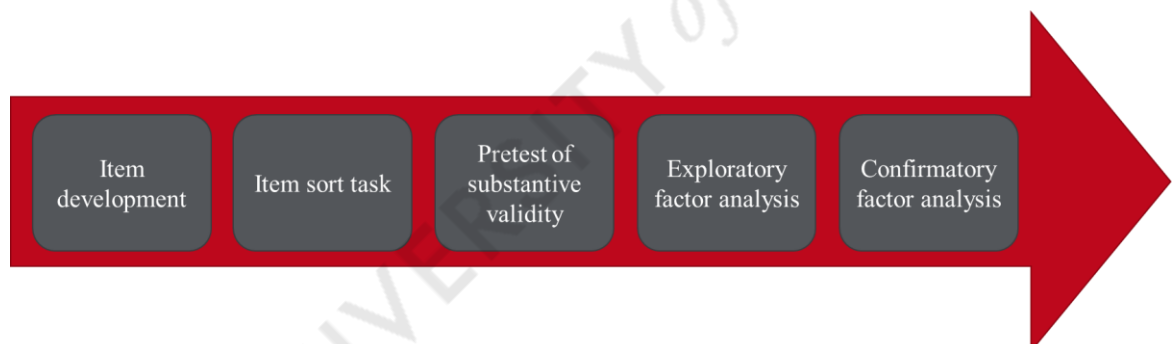
Recent literature points out that it is important that companies equip their employees with a well working package of devices and software, including the possibility to access the (virtual) network, since technology can connect leaders and employees (Schmidt, 2018). Although people are not at the same location, technology enables being present virtually and communicating with each other (Cowan, 2014; Sharpp et al., 2019). As a consequence, leaders must have the ability to use innovative tools and methods (Oberer and Erkollar, 2018) which follows the innovative stream that working life is characterized more by the usage of technology “and [that] virtual work continues to grow in breadth and importance among many industries and organizations” (Charlier et al., 2016, p. 745).

Although the interviewees highlighted the importance of using the right technology, existing research focuses on single aspects of technology instead of a variety of technological aspects, which only allows small insights instead of underlining the big picture. No all-encompassing construct has been established over the time which allows quantitative analysis, including a composition of technological aspects. Larson and DeChurch (2020, p. 12) point out that it is important to be aware of “the various ways team leaders shape technology practices”. Moreover, I8 out of the qualitative study states that “I want to have tools, I want to have IT that makes work fun and that will perhaps in the future also take things off my hands via artificial intelligence, that simply help me to track things, to track processes.”

Therefore, using ICT and being trained to do so is highly relevant (Liu et al., 2018) also in circumstances when employees work flexibly, although no scale could be identified covering the variety of IT infrastructure, software as well as competences/skills, which highlights the need for developing an innovative scale. This will be developed following the multi-method procedure as depicted in figure 5.1 as recommended by Ulaga and Eggert (2006) as well as Churchill (1979). So, an item development, item sort task, pretest of substantive validity, exploratory factor analysis and confirmatory factor analysis will be conducted.

Figure 5.1: Multi-method scale development procedure

Own depiction



5.1.1 Item development

The twelve expert interviews that were conducted have been revisited and several potential items were identified. These have been enriched by additionally analyzing literature as proposed by Müller and Antoni (2020). So, 34 items have been identified in total.

The interview participants pointed out that they communicate with employees via laptop, smartphone/mobile phone, tablet and voice over IP. Moreover, they use hardware from one firm, so technical issues can be solved promptly. In addition, access to (virtual) networks as

well as a broadband network connection are understood as relevant. By applying software, leaders also get in touch with employees; video conferencing, telephone conferencing, email, chat, SMS (short message service), document exchange, collaboration software as well as sharing the calendar help leaders reach out to employees. The communication channels email, chat, cell phone and document exchange have also been discussed in the literature (Coenen and Kok, 2014). The literature pinpointed that wikis (for generating, exchanging and saving knowledge (Hurt et al., 2019; McKibbin et al., 2013)), video presentations as well as an intranet (for informing employees (Liu et al., 2018)) and social media (like blogs for communicating with employees as well as to enable employees to communicate with each other (Ghosh et al., 2014; Leonardi et al., 2013; Liu et al., 2018)) are also important aspects.

In addition, the interviews uncovered that leaders need to be skilled in using ICT because facial expressions and gestures are perhaps not visible, emphasizing the importance of voice and words. Moreover, communication could be misleading since people do not see each other or because a method was used for communication which was not agreed on, also discussed in the literature by Coenen and Kok (2014). In addition, taking care of cybersecurity is important in order to protect data. Roman et al. (2019) support these aforementioned aspects. Müller and Antoni (2020) also support the belief that people must be skilled in using ICT for communication and must know which media are used for which task. Thus, 34 items were developed and summarized in table 5.1 (see an excerpt below, the entire table can be accessed in appendix VI).

Table 5.1: Overview of generated items

Own table

| Aspect | Empirical basis (from the literature or direct interview quote(s)) | Item |
|-------------------------------|--|--|
| Communication with smartphone | Coenen and Kok (2014), Lal and Dwivedi (2009), “These are actually the two things that are now the standard with the cell phone; writing emails and SMS” (I4). | Our leaders use smartphones/cell phones to communicate with employees. |
| Unified hardware | “And that's why we have an iPhone, because we have someone responsible for IT and so on, and she only has to deal with one type of device” (I9). | Our leaders use only one manufacturer's hardware, so maintenance/troubleshooting is easy. |
| Use of (virtual) networks | “Especially those who are not on-site must of course be well connected. They must access here to the firm network” (I2)., “Yes. And we also have a [...] cloud system” (I9). | Our leaders access and use our company's (virtual) networks (e.g., cloud or VPN) from various locations. |
| Chat | Coenen and Kok (2014), “A chat and acquisition channel, a general channel, a chat corner” (I5). | Our leaders use chats (e.g., messenger services) to communicate with employees. |
| Wiki | Hurt et al. (2019), McKibbin et al. (2013), “Or from Atlassian – the wiki – Confluence” (I5). | Our leaders use wikis to store, develop and make knowledge available. |
| Nonverbal signals | Müller and Antoni (2020), “Our employees are equipped with extremely high-definition cameras. This means that I can already see when the corner of my eye goes up or when there is a nuance” (I8). | Our leaders transmit nonverbal signals through digital media. |

5.1.2 Methodology on item formulation and measurement instruments

The construct of technological requirements of virtual leadership will probably subsume these items from the organizational level perspective in which leaders represent participants/informants from a company because a company typically has one leadership culture, HRM (here: develop leaders to communicate virtually) and IT strategy (equip leaders with ICT). While formulating the items, the recommendations from Podsakoff et al. (2003) as well as from Brislin (1986) have been considered. So, the items do not include socially desirable answers, are not complex or ambiguous, and are neutral (Harrison and McLaughlin, 1993; Podsakoff et al., 2003). Moreover, most of them are shorter than 16 words (which is sometimes not fulfilled due to the complexity of the German language), use an active and specific language as well as nouns (instead of pronouns) and do not use colloquialisms, metaphors, subjunctives, adverbs, prepositions, possessive forms and vagueness (Brislin, 1986). Wherever necessary, context information is provided, so the item is clear and not misleading (Brislin, 1986). Furthermore, method biases are avoided (Podsakoff et al., 2003).

Moreover, there have been ongoing discussions for years regarding the specification of constructs, i.e., are they formative or reflective (Hair et al., 2022). Formative constructs are formed by the indicators, while each indicator accounts for a certain aspect (Hair et al., 2022). When constructs are specified as reflective, items are representing the construct (Hair et al., 2022). Thus, “causality is from the construct to its measures” (Hair et al., 2022, p. 51).¹⁰ Referring to Edwards and Bagozzi (2000, p. 156), “little attention has been devoted to the conditions in which measures should be specified as reflective or formative in the first place”. Albers and Hildebrandt (2006) agree on this aspect and highlight that the specification of indicators has to be taken into account when scales are being developed. Typically, either experts are asked to decide if a construct is measured formatively or reflectively (Diamantopoulos and Winklhofer, 2001; Eberl, 2004; Rossiter, 2002), or the researcher decides it on his/her own (Chin, 1998a; Eberl, 2004; Jarvis et al., 2003). To determine the specification, a list with a variety of questions has been provided by Eberl (2004) as well as by Hair et al. (2022). However, there is also the opportunity of applying the so-called TETRAD-test (Bollen and Ting, 2000), but Eberl (2004) criticizes that this test is not able to prove if a construct is reflective or formative. Therefore, in this study the researcher answers questions

¹⁰ A short example: The construct *satisfaction with hotels* can be formatively measured as “The service is good” or “The personnel is friendly” While reflectively measuring it items like “I recommend this hotel to others” or “I am looking forward to staying in this hotel” are used (Albers, 2010).

from the aforementioned lists by Hair et al. (2022) as well as by Eberl (2004) for determining the construct's specificity.

In general, a reflective construct includes measurement errors, leading to the situation in which a reflective construct cannot be explained in total by its indicators (Christophersen and Grape, 2009). Moreover, reflective indicators necessarily correlate with each other (in contrast to formative indicators) because a reflectively measured construct includes indicators (or actions) representing (or reflecting) a holistic strategy (Albers and Hildebrandt, 2006; Christophersen and Grape, 2009). According to MacCallum and Browne (1993), a construct is reflective, if items represent consequences instead of causes (formative). The cause of the construct technological requirements of virtual leadership is the availability of technology and general knowledge in applying it, while the consequence is that a leader uses ICT for communication with employees appropriately. Referring to Jarvis et al. (2003), a construct is reflective if items are interchangeable. In this study, it is very likely that technologically skilled leaders will not only use laptops, but also tablets and video conferencing tools. This is because these tools only have an effect in combination. Thus, a correlation can be assumed and it is not necessarily important to list all conceivable possible technologies or it would not be a problem if one of these aspects (items) were missing. So, due to interchangeability of items it is a reflective scale. Fornell and Bookstein (1982) question if a construct is defined/formed by its items (formative) or if the construct represents the result/explanation of the traits (reflective). In this case, it again is a reflective specification as the construct is rather explained than formed by its items. Diamantopoulos and Winklhofer (2001) ask for the causal priority, which in this case is again reflective as it goes from the construct to the indicator. Therefore, the construct of this scale tends to be reflective because "measures represent the effects (or manifestations) of an underlying construct" (Hair et al., 2017, p. 46) and because the indicators (also called effect indicators) are understood as a sample representing all items that are possibly available in the construct's conceptual area (Hair et al., 2017; Nunnally and Bernstein, 1994).

5.1.3 Item sort task

After the items have been defined, the Heidelberger Struktur-Lege-Technik (H-SLT, structure laying technology) is applied in order to secure content validity (Scheele and Groeben, 1988). Five expert interviews were conducted with four professors for human resource management / business psychology from different German universities of applied sciences as well as one independent HRM researcher (two women, three men) who did not participate in the interviews of the qualitative study leading to an objective procedure. The H-SLT is

typically conducted with people from academia due to possible relationships which are to be visualized for further research (Scheele and Groeben, 2020). During the H-SLT interviews, the participants were asked to assign each listed item to the overall technological requirements of virtual leadership (cf. appendix VII, representing an outcome of one of the five H-SLTs). Therefore, a short definition of the scale was provided, i.e., technological requirements of virtual leadership is defined as the efficient and effective use of technology, including the associated competencies, to lead employees who work flexibly in terms of location and time. The participants had to decide whether or not the item fits to the scale in general. All items that fit – according to the participants – had then to be categorized into different subcategories, defined by participants. In order to do so, the interviewer introduced the H-SLT to the participants, referring to Scheele and Groeben (1988). Usually, pieces of paper (one per item) are used so that participants can sort the pieces according to predefined rules (e.g., how to visualize a relationship, how to visualize subcategories etc.) (Horn and Schweizer, 2015). As the interviews had to be conducted virtually, the interviewer prepared a virtual whiteboard, using draft, containing notes instead of pieces of paper, visualizing items and blank notes for potential dimensions (subcategories) of the scale and additional items. After the experts assigned the items to subcategories, they had the opportunity to sort out items that did not fit. In addition, they had the opportunity to write down and add supplementary items. Finally, the experts were asked to take a critical look at the wording of the items and, if necessary, to suggest changes so that the items were formulated as clearly and comprehensibly as possible (Brislin, 1986; Podsakoff et al., 2003).

While the participants conducted the item sort task, the interviewer observed, but did not comment on it. The visualization has then been discussed, so a communicative validation took place (Scheele and Groeben, 1988). In the end, participant and researcher compared the results of the participants with the researcher's result of the H-SLT. The participants agreed in general on the presented items and suggested to add the aspect of leaders ensuring informal communication in virtual settings. Moreover, the participants highlighted that observable behavior instead of competences should be evaluated because leaders might not know about the competences of other leaders within the company but they can rate what they observe. The intermediate result, which existed after four interviews, was then presented to the fifth participant. In a discussion, one item was identified to be excluded from the concept as it is not distinguishable from another, minor amendments were made according to the formulation of the items and dimensions and 34 items were categorized into three dimensions (subcategories). As a consequence, the relevant items are categorized in three dimensions

(as proposed by the participants) of the scale which are defined by the researcher based on the participants comments as follows:

- (1) The provided hardware and software is actually used: This represents the spectrum and intensity of use of virtual tools.
- (2) (Organizational) support to ensure the ability to work: A framework which allows leaders (and employees) to work flexibly.
- (3) The virtual media are used competently: Leaders use virtual media in an appropriate manner, reflecting their competences.

Table 5.2 below visualizes the concept of technological requirements of virtual leadership, including its dimensions, items as well as the definition of the concept. The dimensions and items have been translated by the researcher since the scale will be further validated and finally used in German and the H-SLT, including the changes in wordings/syntaxes of items, took place in German¹¹. The validated scale will in the end be translated by applying Brislin's (1986) back-translation procedure.

Table 5.2: Structure of the construct technological requirements of virtual leadership

Own table

| Technological requirements of virtual leadership | |
|---|---|
| Technological requirements of virtual leadership is defined as the efficient and effective use of technology, including the associated competencies, to lead employees who work flexibly in terms of location and time. | |
| Dimension | Item |
| A. The provided hardware and software is actually used | 1. Our leaders use laptops to communicate with employees. |
| | 2. Our leaders use smartphones/cell phones to communicate with employees. |
| | 3. Our leaders use tablets to communicate with employees. |
| | 4. Our leaders access and use our company's (virtual) networks (e.g., cloud or VPN) from various locations. |
| | 5. Our leaders use video conferencing to communicate with employees. |
| | 6. Our leaders use telephone conferences to communicate with employees. |
| | 7. Our leaders send emails to communicate with employees. |
| | 8. Our leaders use chat (e.g., messenger services) to communicate with employees. |

¹¹ Appendix VIII contains a table of the German and English versions of the items.

| | |
|--|---|
| | 9. Our leaders use SMS to communicate with employees. |
| | 10. Our leaders share their calendars, including appointment content, with employees. |
| | 11. Our leaders use digital repositories (digital folder structures/databases) to share documents. |
| | 12. Our leaders use collaboration software (e.g. Teams or Confluence). |
| | 13. Our leaders use wikis to store, develop and make knowledge available. |
| | 14. Our leaders use recorded video to make information accessible to employees regardless of time or location. |
| | 15. Our leaders use an intranet to make information available to employees. |
| | 16. Our leaders use internal company social media to communicate with (and among) employees. |
| | 17. Our leaders enable virtual informal communication apart from the work task (e.g., virtual coffee kitchen). |
| | |
| B. (Organizational) support to ensure the ability to work | 18. Our leaders use mostly one manufacturer's hardware so maintenance/troubleshooting is easy. |
| | 19. Our leaders are provided with a stable internet connection for their work locations/times. |
| | 20. Our leaders have access to a very good internet speed (upload/download) for their work locations/times. |
| | 21. Our company provides leaders with a stable mobile network for their work locations/times. |
| | |
| C. The virtual media are used competently | 22. Our leaders are well organized in terms of virtual communication. |
| | 23. Our leaders are aware that misleading communication can result from a lack of gestures/facial expressions (e.g., on the phone/in emails). |
| | 24. Our leaders use a variety of virtual communication methods. |
| | 25. Our leaders combine a variety of communication methods in a meaningful way. |
| | 26. The virtual communication methods used by our leaders contribute to good communication and collaboration. |
| | 27. Our leaders handle various types of technology failures in a goal-oriented manner. |

| | |
|--|---|
| | 28. Our leaders act securely in a virtual environment, so that cybersecurity is enforced. |
| | 29. Our leaders use virtual media within its capabilities and limitations. |
| | 30. Our leaders use virtual media appropriately for the task at hand. |
| | 31. Our leaders use virtual media in a goal-oriented manner. |
| | 32. Our leaders transmit nonverbal signals through virtual media. |
| | 33. Our leaders transmit emotions through virtual media. |
| | 34. Our leaders communicate clearly and concisely virtually. |

5.1.4 Pretest of substantive validity

As substantive validity is important in terms of developing new scales and in quantitative research (Rossiter, 2011), Anderson and Gerbing (1991) provide a procedure to determine whether or not an item belongs to a construct as well as to a dimension as a pretest. Validity analyzes if an instrument is measuring what it is designed for (Field, 2018). Besides validity, reliability and objectivity are important in quantitative analysis (Field, 2018; Rossiter, 2002). In this context, the substantive validity is important as it provides information on the theoretical linkage between item and construct, being a prerequisite for acceptable construct validity (Anderson and Gerbing, 1991). Referring to Anderson and Gerbing (1991), far fewer items should fail in empirical testing of the desired measurement model after applying this pretest. Moreover, the construct designed by a researcher should be more precisely and fully defined prior to conducting empirical research (Anderson and Gerbing, 1991), as pretesting scales has come to be standard practice (Howard, 2018). Testing the substantive validity is used for pretests as only a small sample size of 20 or less (even five works well) is required in which the sample represents the sample of the main study, not only experts (Anderson and Gerbing, 1991; Howard and Melloy, 2016). Therefore, Heads of HRM, Managing Directors, HR Consultants and some Experts make up the sample which is mainly based on participants from SMEs (which, on the one hand, represent the desired sample and is, on the other hand, typically done in this type of pretest (Howard, 2018)) which led to 13 participants. Moreover, the Anderson Gerbing test has been applied several times and recommended for validity evaluation of newly developed constructs (Brykman and Raver, 2021; Busse et al., 2020; Costa et al., 2021; Eberl, 2004; Ulaga and Eggert, 2006). The participants received a short questionnaire with definitions of the construct and an alternative construct as well as definitions of the dimensions (Defren, 2009). The intended construct is the technological requirements of virtual leadership, defined as the efficient and effective use of

technology, including the associated competencies, to lead employees who work flexibly in terms of location and time. In this study, the alternative construct HR commitment practices (defined as: HR commitment practices are a company's commitment to its employees) was chosen as it relates to HRM research and therefore could realistically be chosen by the participants. Moreover, it is distinguishable from leadership constructs which could be blurring with the new scale (intended construct). The defined items had to be allocated to the construct or dimension to which it fits best (Anderson and Gerbing, 1991).

Anderson and Gerbing (1991) set up two different indexes for measuring substantive validity. First, “the proportion of substantive agreement, p_{sa} ”, representing items being assigned to its proposed construct, is calculated below, followed by an example for the first item:

Equation 5.1: Proportion of substantive agreement

Anderson and Gerbing (1991, p. 734)

$$p_{sa} = \frac{n_c}{N} = \frac{12}{13} = .92$$

In this equation, the quantity of respondents who state that a measure is associated with an intended construct (n_c) is divided by all respondents (N) leading to p_{sa} values differing from 0.0 to 1.0 whilst high values indicate great substantive validity (Anderson and Gerbing, 1991). In addition, the c_{sv} value has to be calculated, representing “the substantive-validity coefficient” in which n_o is added, representing “the highest number of assignments of the item to any other construct in the set” (Anderson and Gerbing, 1991, p. 734) (in this case the other construct relates to HR commitment practices), followed by an example for the first item:

Equation 5.2: Substantive-validity coefficient

Anderson and Gerbing (1991, p. 734)

$$c_{sv} = \frac{n_c - n_o}{N} = \frac{12 - 1}{13} = .85$$

In this regard, it is important to only give respondents the posited construct and one other construct because the formula is not capable of dealing with more than two constructs, which has often been done wrong in former studies (Howard and Melloy, 2016). According to Anderson and Gerbing (1991), this c_{sv} value ranges from -1.0 to 1.0, while higher values indicate great substantive validity and negative values indicate that an item belongs to another construct.

For both indicators, there are no predefined cut-off/criterion values (Yao et al., 2008). However, there are researchers referring to those criterion values, like Defren (2009) does, by referring back to existing literature without citing it. Therefore, the cut-off values as mentioned by Defren (2009) will not be applied in this study. Researchers must decide whether an item has to be eliminated or to be retained, as pointed out by Anderson and Gerbing (1991). For this study, positive values will be the criterion to remain an item, while negative values lead to elimination of items as this indicates that they belong to another construct.

For testing statistical significance of the c_{sv} value, a binomial test will be performed with the following null and alternative hypothesis, “where $P(a)$ denotes the probability that an item is assigned to its posited construct” (Howard and Melloy, 2016, p. 177)

$$H_0: P(a) \leq .5$$

$$H_1: P(a) \geq .5$$

Referring to Anderson and Gerbing (1991), the probability that an item will tap the intended construct therefore is .5. Furthermore, m has to be determined which represents the critical number of assignments:

Equation 5.3: Determination of critical value

Anderson and Gerbing (1991, p. 735)

$$P(n_c \geq m) = .05$$

In this study $m = 10$ since the alpha value (generated by applying the binomial test) exceeds .05 if $n_c < 9$. Afterwards it has to be incorporated into the following equation (substituting n_o of the equation 5.2) in order to be able to (not) reject the null hypothesis (Anderson and Gerbing, 1991), followed by a mathematical example for the first item:

Equation 5.4: Analysis of critical value of c_{sv}

Anderson and Gerbing (1991, p. 735)

$$\bar{c}_{sv} = \frac{m - (N - m)}{N} = \frac{2m}{N} - 1$$

Equation 5.5: Exemplary calculation of the critical value of c_{sv}

Own equation, based on Anderson and Gerbing (1991, p. 735)

$$\bar{c}_{sv} = \frac{2 \cdot 10}{13} - 1 = .54$$

The values of \bar{c}_{sv} (critical value of c_{sv}) and c_{sv} should then be compared for analyzing the significance of an item and if the c_{sv} (.85 for the first item) of an item is greater or equal to \bar{c}_{sv} (.54 for the first item), it should be included for future analysis (Howard and Melloy, 2016).

However, there is also criticism of this procedure because the respondents are forced to make a decision in favor of one of the dimensions which might be biased (Schriesheim et al., 1991). Anderson and Gerbing (1991, p. 735) highlight that “in practice, a researcher would most likely employ c_{sv} in a comparative manner, retaining the subset of items with the largest values for each construct, even though values for some items may not attain statistical significance”. Therefore, testing the statistical significance is an additional, but not the only, criterion to decide on whether or not an item should be retained for further analysis (Anderson and Gerbing, 1991). Finally, Anderson and Gerbing (1991) came to the conclusion that the results from the binomial test and the results from a confirmatory factor analysis (CFA) are comparable and led to the same result (they compared both analyses). The results of the pretest are depicted in table 5.3. However, one major point of criticism occurred during the analysis. There are no clear requirements for the alternative construct. Consequently, if an alternative construct that obviously does not fit at all were deliberately used, the results would probably be significantly distorted and would be in favor of the pretest. Of course, this ignores the fact that researchers have a long-term interest in the usability of their analyses and aims at a short-term success (successful pretest).

Table 5.3: Results of pretest of substantive validity

Own table

| Dimension | No. | English item | German item | Assignment of an item to the construct | | | | | | |
|--|-----|--|--|--|-------|-----|----------|----------|----------------|----------------------------|
| | | | | n_c | n_o | N | p_{sa} | c_{sv} | \bar{c}_{sv} | $c_{sv} \geq \bar{c}_{sv}$ |
| A. The provided hardware and software is actually used | 1 | Our leaders use laptops to communicate with employees. | Unsere Führungskräfte nutzen Laptops für die Kommunikation mit Mitarbeitenden. | 12 | 1 | 13 | .92 | .85 | .54 | ✓ |
| | 2 | Our leaders use smartphones/cell phones to communicate with employees. | Unsere Führungskräfte nutzen Smartphones/Handys für die Kommunikation mit Mitarbeitenden. | 10 | 3 | 13 | .77 | .54 | .54 | ✓ |
| | 3 | Our leaders use tablets to communicate with employees. | Unsere Führungskräfte nutzen Tablets für die Kommunikation mit Mitarbeitenden. | 11 | 2 | 13 | .85 | .69 | .54 | ✓ |
| | 4 | Our leaders access and use our company's (virtual) networks (e.g., cloud or VPN) from various locations. | Unsere Führungskräfte greifen von verschiedenen Orten auf (virtuelle) Netzwerke (z. B. Cloud oder VPN) unseres Unternehmens zu und nutzen diese. | 12 | 1 | 13 | .92 | .85 | .54 | ✓ |
| | 5 | Our leaders use video conferencing to communicate with employees. | Unsere Führungskräfte nutzen Videokonferenzen für die Kommunikation mit Mitarbeitenden. | 9 | 4 | 13 | .69 | .38 | .54 | ✗ |
| | 6 | Our leaders use telephone conferences to communicate with employees. | Unsere Führungskräfte nutzen Telefonkonferenzen für die Kommunikation mit Mitarbeitenden. | 12 | 1 | 13 | .92 | .85 | .54 | ✓ |
| | 7 | Our leaders send emails to communicate with employees. | Unsere Führungskräfte senden E-Mails für die Kommunikation mit Mitarbeitenden. | 10 | 3 | 13 | .77 | .54 | .54 | ✓ |
| | 8 | Our leaders use chat (e.g., messenger services) to communicate with employees. | Unsere Führungskräfte nutzen Chats (z. B. Messenger-Dienste) für die Kommunikation mit Mitarbeitenden. | 10 | 3 | 13 | .77 | .54 | .54 | ✓ |
| | 9 | Our leaders use SMS to communicate with employees. | Unsere Führungskräfte nutzen SMS für die Kommunikation mit Mitarbeitenden. | 11 | 2 | 13 | .85 | .69 | .54 | ✓ |
| | 10 | Our leaders share their calendars, including appointment content, with employees. | Unsere Führungskräfte teilen ihre Kalender inkl. der Termininhalte mit den Mitarbeitenden. | 7 | 6 | 13 | .54 | .08 | .54 | ✗ |
| | 11 | Our leaders use digital repositories (digital folder structures/databases) to share documents. | Unsere Führungskräfte nutzen digitale Ablagen (digitale Ordnerstrukturen/Datenbanken) für den Austausch von Dokumenten. | 12 | 1 | 13 | .92 | .85 | .54 | ✓ |
| | 12 | Our leaders use collaboration software (e.g. Teams or Confluence). | Unsere Führungskräfte nutzen Kollaborationssoftware (z. B. Teams oder Confluence). | 10 | 3 | 13 | .77 | .54 | .54 | ✓ |
| | 13 | Our leaders use wikis to store, develop and make knowledge available. | Unsere Führungskräfte setzen Wikis ein, um Wissen zu speichern, weiterzuentwickeln und verfügbar zu machen. | 11 | 2 | 13 | .85 | .69 | .54 | ✓ |
| | 14 | Our leaders use recorded video to make information accessible to employees regardless of time or location. | Unsere Führungskräfte nutzen aufgezeichnete Videos, um Mitarbeitenden zeitunabhängig Informationen zugänglich zu machen. | 9 | 4 | 13 | .69 | .38 | .54 | ✗ |
| | 15 | Our leaders use an intranet to make information available to employees. | Unsere Führungskräfte nutzen ein Intranet, um Mitarbeitenden Informationen zur Verfügung zu stellen. | 9 | 3 | 12 | .75 | .50 | .67 | ✗ |
| | 16 | Our leaders use internal company social media to communicate with (and among) employees. | Unsere Führungskräfte nutzen unternehmensinterne soziale Medien, um mit (und unter) Mitarbeitenden zu kommunizieren. | 5 | 8 | 13 | .38 | -.23 | .54 | ✗ |
| | 17 | Our leaders enable virtual informal communication apart from the work task (e.g. virtual coffee kitchen). | Unsere Führungskräfte ermöglichen virtuell informelle Kommunikation abseits der Arbeitsaufgabe (z. B. virtuelle Kaffeeküche). | 3 | 10 | 13 | .23 | -.54 | .54 | ✗ |

| Dimension | No. | English item | German item | Assignment of an item to the construct | | | | | | |
|--|-----|--|---|--|-------|-----|----------|----------|----------------|----------------------------|
| | | | | n_c | n_o | N | p_{sa} | c_{sv} | \bar{c}_{sv} | $c_{sv} \geq \bar{c}_{sv}$ |
| B. (Organizational) support to ensure the ability to work | 18 | Our leaders use mostly one manufacturer's hardware so maintenance/troubleshooting is easy. | Unsere Führungskräfte nutzen überwiegend Hardware eines Herstellers, damit die Wartung/Fehlerbehebung einfach ist. | 12 | 1 | 13 | .92 | .85 | .54 | ✓ |
| | 19 | Our leaders are provided with a stable internet connection for their work locations/times. | Unsere Führungskräfte steht eine stabile Internetverbindung für ihre Arbeitsorte/-zeiten zur Verfügung. | 12 | 1 | 13 | .92 | .85 | .54 | ✓ |
| | 20 | Our leaders have access to a very good internet speed (upload/download) for their work locations/times. | Unsere Führungskräfte steht eine für deren Zwecke sehr gute Internetgeschwindigkeit (Upload/Download) für ihre Arbeitsorte/-zeiten zur Verfügung. | 12 | 1 | 13 | .92 | .85 | .54 | ✓ |
| | 21 | Our company provides leaders with a stable mobile network for their work locations/times. | Unser Unternehmen stellt Führungskräften ein stabiles Mobilfunknetz für ihre Arbeitsorte/-zeiten zur Verfügung. | 10 | 3 | 13 | .77 | .54 | .54 | ✓ |
| C. The virtual media are used competently | 22 | Our leaders are well organized in terms of virtual communication. | Unsere Führungskräfte sind hinsichtlich der virtuellen Kommunikation gut organisiert. | 8 | 5 | 13 | .62 | .23 | .54 | ✗ |
| | 23 | Our leaders are aware that misleading communication can result from a lack of gestures/facial expressions (e.g., on the phone/in e-mails). | Unsere Führungskräfte ist bewusst, dass missverständliche Kommunikation durch fehlende Gestik/Mimik (z. B. am Telefon/in E-Mails) entstehen kann. | 6 | 7 | 13 | .46 | -.08 | .54 | ✗ |
| | 24 | Our leaders use a variety of virtual communication methods. | Unsere Führungskräfte nutzen eine Vielzahl von virtuellen Kommunikationsmethoden | 11 | 2 | 13 | .85 | .69 | .54 | ✓ |
| | 25 | Our leaders combine a variety of communication methods in a meaningful way. | Unsere Führungskräfte kombinieren eine Vielzahl von Kommunikationsmethoden sinnvoll. | 8 | 4 | 12 | .67 | .33 | .67 | ✗ |
| | 26 | The virtual communication methods used by our leaders contribute to good communication and collaboration. | Die von unseren Führungskräften genutzten virtuellen Kommunikationsmethoden tragen zu guter Kommunikation und Zusammenarbeit bei. | 4 | 9 | 13 | .31 | -.38 | .54 | ✗ |
| | 27 | Our leaders handle various types of technology failures in a goal-oriented manner. | Unsere Führungskräfte gehen mit verschiedenen Arten von Technologieausfällen zielführend um. | 8 | 4 | 12 | .67 | .33 | .67 | ✗ |
| | 28 | Our leaders act securely in a virtual environment, so that cybersecurity is enforced. | Unsere Führungskräfte agieren virtuell sicher, sodass Cybersicherheit forciert wird. | 10 | 3 | 13 | .77 | .54 | .54 | ✓ |
| | 29 | Our leaders use virtual media within its capabilities and limitations. | Unsere Führungskräfte nutzen virtuelle Medien im Rahmen der Möglichkeiten und Grenzen der virtuellen Medien. | 10 | 3 | 13 | .77 | .54 | .54 | ✓ |
| | 30 | Our leaders use virtual media appropriately for the task at hand. | Unsere Führungskräfte setzen virtuelle Medien aufgabengerecht ein. | 11 | 2 | 13 | .85 | .69 | .54 | ✓ |
| | 31 | Our leaders use virtual media in a goal-oriented manner. | Unsere Führungskräfte gehen mit virtuellen Medien zielgerichtet um. | 10 | 3 | 13 | .77 | .54 | .54 | ✓ |
| | 32 | Our leaders transmit nonverbal signals through virtual media. | Unsere Führungskräfte übertragen nonverbale Signale über virtuelle Medien. | 5 | 8 | 13 | .38 | -.23 | .54 | ✗ |
| | 33 | Our leaders transmit emotions through virtual media. | Unsere Führungskräfte übertragen Emotionen über virtuelle Medien. | 3 | 10 | 13 | .23 | -.54 | .54 | ✗ |
| | 34 | Our leaders communicate clearly and concisely virtually. | Unsere Führungskräfte kommunizieren virtuell klar und deutlich. | 7 | 6 | 13 | .54 | .08 | .54 | ✗ |
| Descriptive statistics | | | Mean | | | | | | | |
| | | | Median | | | | | | | |
| | | | Standard deviation | | | | | | | |
| Descriptive statistics after elimination of items with $c_{sv} < 0.01$ (no. 16, 17, 23, 26, 32 and 33) | | | Mean | | | | | | | |
| | | | Median | | | | | | | |
| | | | Standard deviation | | | | | | | |

The results indicate that all items have positive p_{sa} values ranging from .23 to .92 with an average (= mean = M) p_{sa} value of .71 (median (Mdn) = .77, SD = .21) for the scale. The c_{sv} values are ranging from -.54 to .85 with a scale's average of .41 (Mdn = .54, SD = .41). Moreover, the test for statistical significance shows that 20 out of 34 items, representing 58.82%, are statistically significant and therefore confirming the alternative hypotheses, while 14 items (41.18%) are not significant, not rejecting the null hypotheses. As proposed by Anderson and Gerbing (1991), p_{sa} and c_{sv} values will be employed for evaluating whether or not an item will be retained. Since all items have positive p_{sa} values, the c_{sv} value will be in the limelight according to this decision. Six of 34 items (17.65%) have negative c_{sv} values and are in addition not significant. These are the following items:

16. Our leaders use internal company social media to communicate with (and among) employees.
17. Our leaders enable virtual informal communication apart from the work task (e.g., virtual coffee kitchen).
23. Our leaders are aware that misleading communication can result from a lack of gestures/facial expressions (e.g., on the phone/in emails).
26. The virtual communication methods used by our leaders contribute to good communication and collaboration.
32. Our leaders transmit nonverbal signals through virtual media.
33. Our leaders transmit emotions through virtual media.

As negative values indicate that the items load on other constructs (in this case HR commitment practices) and therefore do not load on the intended construct, these six items will be eliminated. After the elimination of the six items the scale's average p_{sa} value accounts for .79 (Mdn = .77, SD = .11), the scale's average c_{sv} values is .57 (Mdn = .54, SD = .23) and eight of the remaining items are not significant, while 20 still are significant.

Thus, 28 items (82.35%) remain after the pretest of substantive validity and seem to belong to the construct of technological requirements of virtual leadership. These 28 items will therefore be included in further analysis for validation.

In addition to the analysis of the items belonging to the construct, the technique has also been applied in order to pretest whether an item belongs to the intended dimension, which is not a requirement, according to Anderson and Gerbing (1991). The negative c_{sv} values (cf. appendix IX) uncovered that 13 items that were intended for the first dimension (the provided hardware and software is actually used) is not confirmed, although the structure was

developed within the H-SLT. In the other two dimensions, one item each did not meet the threshold of a positive c_{sv} value. These low levels of p_{sa} ($M = .45$, $Mdn = .46$, $SD = .24$) and especially of c_{sv} values ($M = .05$, $Mdn = .08$, $SD = .40$) come in line with three significant items, which results in 31 nonsignificant items. Therefore, the overall fit between item and dimension is very weak and it is expected that the exploratory factor analysis (cf. next chapter) could uncover an alternative (factor) structure among the remaining 28 items.

5.1.5 Exploratory factor analysis

An exploratory factor analysis (EFA) is typically conducted in order to differentiate one scale into subscales of the predefined construct, to validate and to purify a construct (Churchill, 1979; Döring and Bortz, 2016). Besides establishing a structure in terms of factors (or latent variables; wordings used in factor analysis instead of construct), items can be identified which have to be eliminated as they do not fit to the intended factors, reducing data down to a size which is manageable (Bühner, 2021; Field, 2018). Accordingly, the EFA sets the foundation for to be developed questionnaires on the new latent variable (these are typically not measurable directly) (Field, 2018).

This study's questionnaire included the predefined and pretested 28 items which had to be rated on a seven-point Likert scale, as recommended by Backhaus et al. (2018). The scale's extrema were labeled as 0 = totally disagree respectively 6 = totally agree. The items were ordered randomly for circumventing potential order effects (Lavrakas, 2008). Furthermore, anonymous information had to be provided, such as the first number of the postal code, the first letter of the street name where the company is located and the first three letters of the company's name. These had to be calculated following a simple procedure to ensure in the end that only one leader per company participated in the survey and no company (or their attitudes) is overrepresented (Winnen, 2015).

After a pretest with three participants and some revisions, from June until August 2021 the questionnaire has been sent out to a variety of potential participants as a weblink, using SoSci Survey (Leiner, 2019) via email, posted in social networks as well as sent to contact persons in business networks which forwarded it to the members of the network (snowball sampling), beginning with a cover letter following the recommendations of Podsakoff et al. (2012). In this case a mixture of snowball and cluster sampling (Miles et al., 2014; Teddlie and Tashakkori, 2009) is applied since potential respondents were invited to participate via websites or social networks where the questionnaire was uploaded, with or without a personal invitation (Kumar, 2014). In sum, 232 people have been reached personally (e.g., via email) and 1,022,127 people have been reached via groups in social networks. Since every single person

of the sample had the chance to forward the questionnaire to others (snowball sampling), it is not calculable how many people received the questionnaire in total and therefore no response rate can be presented. However, a minimum of 1,022,359 people had the chance to participate in the questionnaire which led to 868 people clicking on the link to the questionnaire and to 153 respondents that began the fulfillment of the questionnaire. Since the SME criteria referring to the European Commission have been included in the questionnaire, the descriptive statistics unveil that 49% of the sample are SMEs, 40% are large companies and for 11% it is unclear whether they are an SME due to missing data.

As recommended by van Buuren and Groothuis-Oudshoorn (2011) as well as Lall (2016) multivariate imputation by chained equations (MICE) have been used to handle missing values because MICE does not delete cases with missing values and therefore bias the data but it replaces missing values using information from the original data set. In this case, 116 values were missing (3.8%) in the whole dataset. Dealing with missing values is important in research since deletion of cases could bias the data and researchers conclude that using multiple imputation is a procedure which is superior to single imputations or case deletions (Döring and Bortz, 2016; IBM Corp., 2021; Jekauc et al., 2012). MICE was applied following the instructions from Heymans and Eekhout (2019) as well as van Buuren and Groothuis-Oudshoorn (2011) applying IBM SPSS version 28.0.0.0 (190). The visual analysis of the data pattern came to the conclusion that missing are at random (MAR). Moreover, missing were completely at random (MCAR) which is confirmed by Little's (1988) MCAR test that represents a result which is not significant and therefore rejecting the null hypotheses, stating that the data is not MCAR ($\chi^2 = 800.665$, degrees of freedom = 787, significance = .360). Therefore, the data has missing at random, representing a requirement for MICE and additionally missing completely at random, a desirable (although not necessary) condition for MICE (Jekauc et al., 2012; Lall, 2016). The application of MICE with five imputations led to five data sets which have been pooled into one data set, using the Bar Procedure (Baranzini, 2018) as recommended by Okorn et al. (2021).

The generated data set will only include fully completed questionnaires for which participants gave consent. Furthermore, participants that are not (company) leaders were excluded. Participants that completed the questionnaire too fast (speed runner) have also been excluded based on the deg-time index exceeding 75, which represents a rigorous filter (Leiner, 2019). Finally, companies that participated more than once are excluded in order not to overrepresent one company's opinion. After this data clearing procedure (summarized in table 5.4), 109 questionnaires represent the remaining and usable sample for the EFA.

Table 5.4: Clearing of data set

Own table

| Clearing level | Data sets |
|--|------------------|
| Participants starting to fulfill the questionnaire | 153 |
| Fully completed questionnaires | 121 |
| No consent to participation | -1 |
| Filter question on position in the company | - 10 |
| Speed runner | - 1 |
| Companies involved more than once | - 0 |
| Remaining observations for EFA | N = 109 |

This EFA is conducted as a maximum likelihood extraction method with a varimax rotation using IBM SPSS version 28.0.0.0 (190), aiming at generating highly dispersed factors (Bühner, 2021; Field, 2018; Schreiber, 2021). This type is typically conducted before a confirmatory factor analysis (Bühner, 2011). The Bartlett test in particular requires “roughly normal distributions” of data (Field, 2013, p. 686). Due to this, the Kolmogorov-Smirnov test as well as the Shapiro-Wilk test were applied and uncovered significance for every item, leading to non-normally distributed data. Hair et al. (2017, p. 61) recommend to “examine two measures of distributions – skewness and kurtosis” as these tests lead to more reliable results than the Kolmogorov-Smirnov or the Shapiro-Wilk test, which “provide only limited guidance when deciding whether the data are too far from being normally distributed”. Since the skewness of items ranges from -1.927 to 1.431 and kurtosis ranges from -1.366 to 2.829, data can be characterized as roughly normally distributed, which is required.

Referring to Bühner (2011) a sample size of 100 or less (or of course more than 100) is sufficient for an EFA, which has been exceeded in this study. Moreover, an average communality of more than .60 is required for conducting an EFA (Bühner, 2021; MacCallum et al., 1999). Communalities represent the amount of explained variance of an item through the extracted factor, as it is “the proportion of common variance present in a variable” (Field, 2018, p. 811). This is also fulfilled, since the EFA led to an average communality of .60. Before analyzing the factors, including the allocated items, general quality criteria have to be evaluated, starting with the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy indicating how reliable the extracted factors will be (Field, 2018). The KMO should be above .5 (Kaiser, 1974). In this case, the KMO value is .838, representing a meritorious value, according to Kaiser (1974).

The next step is to conduct and interpret Bartlett's test of sphericity which provides information on whether the correlations of variables differ significantly from zero (Backhaus et al., 2018; Field, 2018). A minimum correlation is required as this represents that those items measure the same construct (Field, 2018). This test depends on the sample size, which means that it is more likely to be significant if the sample size is large (Bühner, 2021; Field, 2018). The Bartlett test of sphericity is significant ($\chi^2 = 1710.289$, $p < .001$). Therefore, both the Bartlett test and the KMO, highlight that the sample is usable for conducting an EFA.

In addition to the Bartlett test, the correlation matrix will be analyzed and variables with correlations of $r > .8$ will be considered to be eliminated in order to remedy multicollinearity, meaning "a strong correlation between two or more predictors" (Field, 2013, p. 324). Therefore, the "trial and error" procedure is followed, as recommended by Field (2018, p. 799). This was not the case.

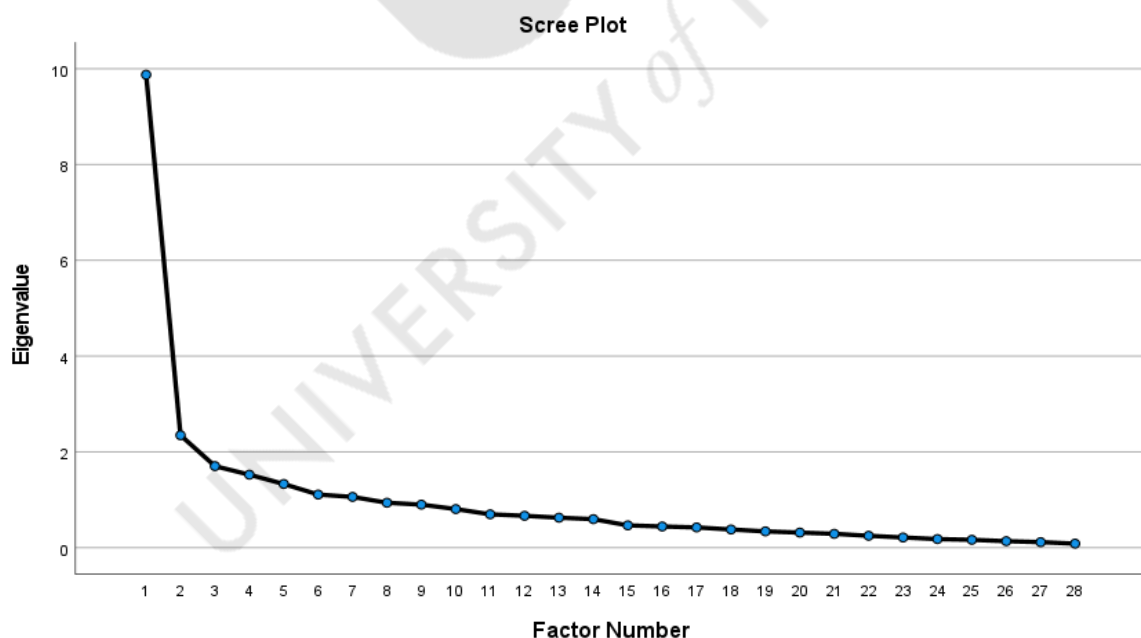
The Anti-image matrix contains information on correlations as well as covariances, the Measure-of-Sample-Adequacy criterion (MSA), which should gain a minimum value of .5 (Bühner, 2021; Backhaus et al., 2018; Field, 2013). The MSA is comparable to the KMO, but for each variable and not for the sample (Field, 2018). If this is not the case, the variable should be deleted (in case it is making sense predominantly based on content considerations), as adequacy of sampling can be increased that way (Bühner, 2021; Backhaus et al., 2018; Field, 2013). The measure of sample adequacy (MSA criterion) is therefore representing a variable-based KMO criterion (Backhaus et al., 2018). In this case, only variable TVAL_09 has an MSA below .5 (MSA = .259) which leads to the exclusion of this variable.

The communalities are representing the reliability of an item which should at least not be below .5 if the sample is between 100 and 200 (Bühner, 2011; Field, 2013), while values can vary from 0 (no variance shared with other variables) to 1 (no random or unique variance) (Field, 2013). As a consequence, the following variables have been excluded from further analysis: TVAL_02, TVAL_03, TVAL_06, TVAL_07, TVAL_09, TVAL_10, TVAL_14 and TVAL_18. The average communality is .6 and the median is .63. After the extraction of the aforementioned variables, the mean increased up to .67 and the median increased up to .70.

The next step is the factor extraction in which the decision on how many factors will be used for further analysis will be made while the maximum number of factors is equated to the number of variables (Backhaus et al., 2018; Field, 2018). As already pointed out, this EFA is conducted as a maximum likelihood extraction method with a varimax rotation, aiming at

generating highly dispersed factors (Bühner, 2021; Field, 2018; Schreiber, 2021) as this typically is conducted before a confirmatory factor analysis (Bühner, 2011). In extracting the factors SPSS focuses on the Eigenvalues¹² which are supposed to be greater than 1, called Kaiser criterion (Backhaus et al., 2018; Field, 2018; Kaiser, 1960). Furthermore, the scree plot helps to determine how many factors should be extracted as the curve inflects at some point and only the number of factors on the left side of the inflexion will be extracted, while the curve has the components on the x-axis and the eigenvalues on the y-axis which are typically above 1 before the inflexion appears (Backhaus et al., 2018; Field, 2013). In the end, the researcher has to decide subjectively, but guided by the Kaiser criterion as well as the scree plot, how many factors will be extracted (Backhaus et al., 2018). In this case, two factors (cf. appendix X for factor matrix) are going to be extracted based on the scree plot which has the point of inflexion at the third factor (cf. figure 5.2). If just the Eigenvalues were considered, seven factors (cf. appendix XI) would be extracted which would lead to factors with only one or two items which is not desirable (Bühner, 2021) and shows that the factor number has been overestimated by using Kaiser's criterion (Field, 2013).

Figure 5.2: Scree Plot of the EFA
Own depiction, visualized via IBM SPSS



The factor rotation leads to a more differentiated picture as loadings of variables on factors are maximized, leading to a situation in which results of an EFA become interpretable

¹² Eigenvalues are indicating multicollinearity and therefore the number of Eigenvalues indicates how many multicollinearity linkages exist on a data set (Schneider, 2009).

(Backhaus et al., 2018; Field, 2013). The factor rotation leads to a situation in which two factors have been extracted. Since the loadings of a variable on a factor should be at least .3 and since the cross loadings of variables (so one variable loads on two or more factors) should be below .3 (Bühner, 2011), the following items will be eliminated based on the rotated factor matrix (cf. appendix XII):

- Factor loadings below .3: TVAL_03, TVAL_09 and TVAL_18
- Cross loadings above .3: TVAL_05*, TVAL_11*, TVAL_12, TVAL_22, TVAL_24, TVAL_25, TVAL_29*, TVAL_30* and TVAL_34

Since four items (marked with an asterisk) only slightly exceeded the threshold concerning the cross loadings but have high loadings on the factors, they are not deleted directly but remain in the scale for the moment as they also fit in the dimensions theoretically (see below). A deletion could then take place within the CFA, if necessary. However, as a consequence, a reduced matrix evolved which contains the remaining variables in a two-factor structure (cf. appendix XIII). For both factors, the Cronbach's alpha values have been calculated and presented, as these are important in reporting an EFA (Field, 2013). The presented Cronbach's alpha values are both above .7, representing a very well-founded alpha level for this new scale (Field, 2018; Saunders et al., 2016) and very close or exceeding .8 which is sometimes also recommended as a threshold (Bryman, 2016; Field, 2018).

The final composition of the new scale is summarized in table 5.5 and contains two factors. One factor is named *Competent usage of virtual media in communication with employees*. It contains eight items and has a Cronbach's alpha value of .860. The second factor is called *(Organizational) support to ensure the ability to work flexibly*. This factor contains seven items and has a Cronbach's alpha value of .795. The names of the factors are derived from previous analysis, like the H-SLT and pretest of substantive validity. Therefore, the name of the second factor did not change, but includes more items now than after completion of the H-SLT and Anderson Gerbing test. Since the beginning of the scale development, there was an ongoing discussion between participants whether a company provides a laptop, for instance, or if the focus is on the usage of those instruments. Due to this, the factor was named *The provided hardware and software is actually used* after completion of the H-SLT to underline this kind of implicit support by the organization. However, the EFA uncovered the structure depicted in table 5.5 and the researcher has to name the factors. Since the organization typically provides laptops or digital repositories to leaders as well as employees, the rearrangement of items into two factors is comprehensible to the researcher based on the knowledge of the aforementioned discussions.

The other factor, named *Competent usage of virtual media in communication with employees*, is also related to prior analysis. It is a mixture of items for the two factors *The provided hardware and software is actually used* and *The virtual media are used competently* which have been defined after the H-SLT. But the factor has now a new emphasis as it focuses on communication with employees. This is also reflected by the items since it is about using virtual media in a goal-oriented, secure manner and providing information via platforms (intranet, wiki) or via chats to employees.

Table 5.5: Composition of the scale after the EFA

Own table

| Variable | Description | Factor | Cronbach's alpha |
|----------|--|---|------------------|
| TVAL_31 | Our leaders use virtual media in a goal-oriented manner. | Competent usage of virtual media in communication with employees | $\alpha = .860$ |
| TVAL_27 | Our leaders handle various types of technology failures in a goal-oriented manner. | | |
| TVAL_29* | Our leaders use virtual media within its capabilities and limitations. | | |
| TVAL_30* | Our leaders use virtual media appropriately for the task at hand. | | |
| TVAL_28 | Our leaders act securely in a virtual environment, so that cybersecurity is enforced. | | |
| TVAL_13 | Our leaders use wikis to store, develop and make knowledge available. | | |
| TVAL_08 | Our leaders use chat (e.g., messenger services) to communicate with employees. | | |
| TVAL_15 | Our leaders use an intranet to make information available to employees. | | |
| TVAL_04 | Our leaders access and use our company's (virtual) networks (e.g., cloud or VPN) from various locations. | (Organizational) support to ensure the ability to work flexibly | $\alpha = .795$ |
| TVAL_01 | Our leaders use laptops to communicate with employees. | | |

| | | | |
|----------|---|--|--|
| TVAL_11* | Our leaders use digital repositories (digital folder structures/databases) to share documents. | | |
| TVAL_05* | Our leaders use video conferencing to communicate with employees. | | |
| TVAL_21 | Our company provides leaders with a stable mobile network for their work locations/times. | | |
| TVAL_20 | Our leaders have access to a very good internet speed (upload/download) for their work locations/times. | | |
| TVAL_19 | Our leaders are provided with a stable internet connection for their work locations/times. | | |

5.1.6 Confirmatory factor analysis

Factor analysis, in general, is a data analysis method aiming at reducing the variables by additionally uncovering “an inherent structure to the large number of items that often make up such measures” (Bryman, 2016, p. 168). In this case, the confirmatory factor analysis (CFA) will be conducted in order to test hypotheses regarding the latent variable’s structure aiming at confirming it (Field, 2018; Hair, Black et al., 2019). Moreover, the CFA leads to a deeper understanding of the structure of the latent variable (Bandalos and Finney, 2010). The overall aim of the CFA in this study is “to further test the structure that was championed from the exploratory analysis” (Bandalos and Finney, 2010, p. 96). As a consequence, a CFA is a contrast to EFA with different aims (Kline, 2016).

For a CFA, specific statistical software like AMOS is needed, as it is a particular type of SEM¹³ (Bandalos and Finney, 2010). Analysis of Moment Structures (AMOS) is typically used for CFA as it is a module of the SPSS software which functions without any programming codes or syntactic commands as it uses an interface which is graphical (Bandalos and Finney, 2010; Hair, Black et al., 2019). Following the overall idea of using CFA in order to confirm the hypothesized structure (confirmatory modeling strategy), a specific model is composed and analyzed regarding its fit indices (Hair, Black et al., 2019). There are six

¹³ A detailed introduction to SEM will be given in chapter 5.2.4.2, as the focus of this chapter is the CFA.

stages of SEM, while the CFA is conducted in stages one to four which are now passed through (Hair, Black et al., 2019).

According to Hair, Black et al. (2019), in the first stage (defining individual constructs) it is important to either test an existing scale or to use items for validating a new scale. In this case, it is the validation of a new scale called *technological requirements of virtual leadership (TRVL)*. A pretest is also a necessary prerequisite in this stage as it ensures the appropriateness of items. In this study, a pretest has been conducted with three respondents which led to slight adaptations of the questionnaire but the wording of the items of the new scale did not change since the items have been developed on a multi-method approach (cf. chapter 5.1).

Referring to Hair, Black et al. (2019), in the second stage, development of the overall measurement model, all items and latent variables must be included in the AMOS software. It is important that unidimensional measures (standard for CFA) are applied, meaning that each indicator is caused by one latent variable (Hair, Black et al., 2019; Kline, 2016). If a model is not unidimensional, high cross-loadings exist, leading to lower construct validity (Hair, Black et al., 2019). Moreover, error terms of indicators (responsible for other reasons/causes) can also be related within or between the constructs, leading to within-construct or between-construct error covariance (Hair, Black et al., 2019; Kline, 2016). Covariances (correlations) between error terms of different latent variables reduce construct validity, as within-construct error covariance leads to a lower discriminant validity (Hair, Black et al., 2019; Kline, 2016).

How many items are related to one construct is often discussed because implementing a lot of indicators increases reliability while researchers are encouraged to use the “smallest number of indicators to adequately represent a construct”, called parsimony (Hair, Black et al., 2019, p. 665). Therefore, latent variables are called just identified when the degrees of freedom are zero (also called saturated), while SEM aims at overidentified latent variables with a positive degree of freedom (Hair, Black et al., 2019; Kline, 2016). A general rule of thumb states that a minimum of three (better four) indicators should be present for one latent variable or a minimum of two indicators per latent variable, if the overall model has two or more latent variables, avoiding statistical issues (Hair, Black et al., 2019; Kline, 2016). Finally, the researcher must consider whether the latent variable is measured reflectively or formatively (Hair, Black et al., 2019).

In this study, only the technological requirements of virtual leadership will be analyzed through a CFA for validation purposes by using IBM SPSS AMOS version 28.0.0.0. Therefore, no relationships will be depicted but the one latent variable. Figures 5.3 and 5.4 illustrate the latent variables with its seven indicators each and their associated error terms.

Figure 5.3: Structure of factor 1 in AMOS before analysis

Own depiction

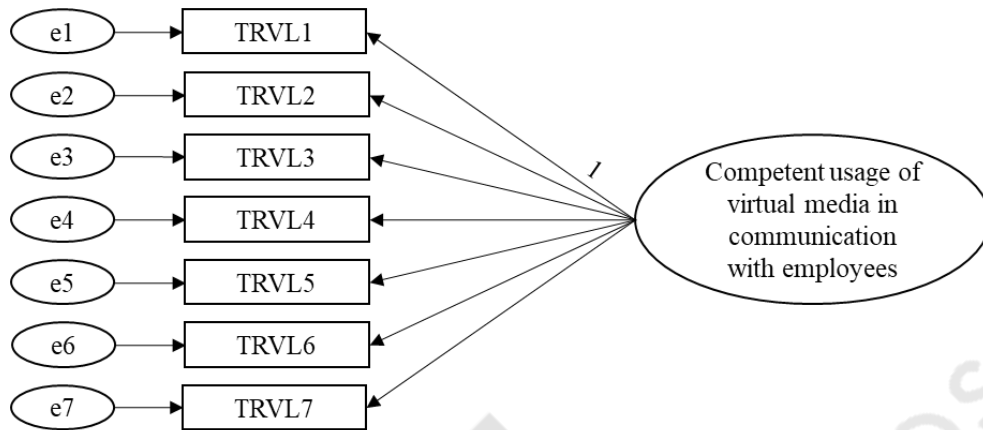
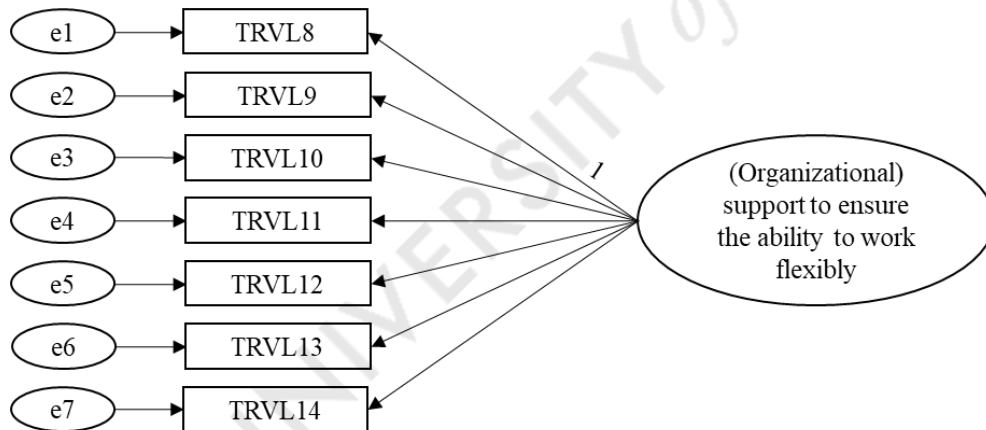


Figure 5.4: Structure of factor 2 in AMOS before analysis

Own depiction



As the scale is developed conscientiously, the researcher expects it to be unidimensional. Furthermore, based on a priori considerations, the scale has per definition (so far) two latent variables with seven indicators in both cases. Therefore, the latent variables should be overidentified since the rule of thumb was applied. However, if the scale (or, in this case, the model) is underidentified (degree of freedom below zero), the model will be revised, as supposed by Kline (2016). The scale is predefined as a reflective measurement.

According to Hair, Black et al. (2019), in the third stage, a study will be designed in order to obtain results empirically. For SEM it is important to use ordinal or interval scales, which can be different between the indicators. As typically for statistical methods, sample size matters also for SEM since a more stable result is generated based on a large sample. There is no overall guideline which provides an appropriate answer on how large the sample should be. However, Ho (2014) set up a ratio for assessing the sample size which states that 10 cases refer to one item. In this study, 173 cases were generated, leading to a maximum number of 17 items. For the two factors, there are seven items each, so 14 in total and thus meeting the requirement by Ho (2014). These 173 cases were generated through the conducted survey with its questionnaire as designed and presented in chapter 5.2.2. Further explanations on the questionnaire, data generation as well as the sample follow in chapter 5.2.2, since the questionnaire is also used for structural equation modeling. At this stage, the results of the questionnaire are used for the CFA. Now the focus is on completing the scale development process.

Referring to Hair, Black et al. (2019), a study needs to be designed in order to achieve empirical results in the third stage. Therefore, data needs to be generated and the sample size must be evaluated after data generation. Furthermore, the model must be specified, i.e., drawn in AMOS and variables must be included. So, indicators are linked to latent variables, called setting the scale (cf. figures 5.3 and 5.4), and one loading of one indicator has to be fixed, otherwise AMOS does not perform a CFA.

In this study the MICE procedure (multivariate imputation by chained equations) has again, as for the EFA, been applied in order to deal with missing values, as recommended by van Buuren and Groothuis-Oudshoorn (2011) as well as Lall (2016) and following the instructions from Heymans and Eekhout (2019) as well as van Buuren and Groothuis-Oudshoorn (2011) applying IBM SPSS version 28.0.1.0 (142). In the data set, 5.0% of the values were missing. The missing are at random (MAR), representing the result of the visual data analysis for potential data patterns. The additionally conducted MCAR test by Little (1988) uncovers that data is not MCAR due to a significant chi-square test ($\chi^2 = 8750.829$, degrees of freedom = 8506, significance = .031). Thus, the MAR requirement is fulfilled while MCAR (which is desirable but not necessarily required) is not fulfilled. As a consequence, the MAR test is more important than the MCAR test for using MICE since it cannot be applied if missing are not at random (Jekauc et al., 2012; Lall, 2016). Thus, MICE can be used in this case. It was applied with five imputations, leading into one pooled data set by using Baranzini's

(2018) Bar Procedure as recommended by Okorn et al. (2021). This pooled data set will now be used for the CFA and later for the PLS-SEM analysis.

The two latent variables were analyzed separately in the first step. Therefore, the defined scales have been analyzed using AMOS. For the first factor (Competent usage of virtual media in communication with employees), three items (TRVL6, TRVL7, TRVL5) had to be deleted one after another as they did not fulfill the criterion of having a factor loading of more than .5 as required by Hair, Black et al. (2019), cf. figure 5.5. Thereafter, the criterion regarding the factor loading was met. Furthermore, the fit indices were evaluated, cf. table 5.6.

Figure 5.5: CFA result for Factor 1

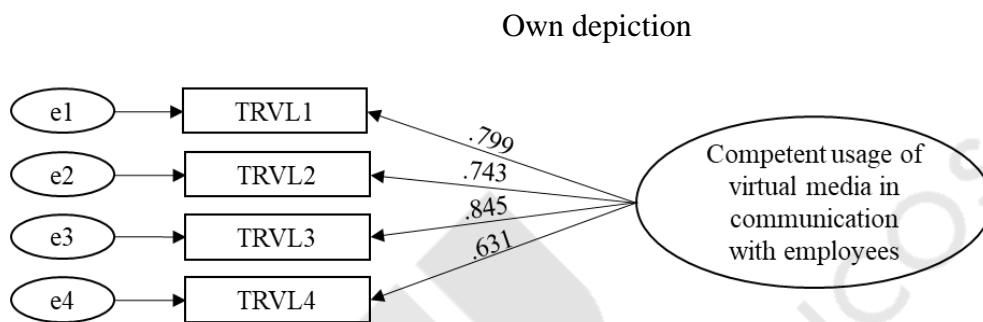


Table 5.6: CFA model fit indices for factor 1

Own table, indices based on Byrne (2016), Hair, Black et al. (2019) and Kline (2016)

| Criterion (desired result in brackets) | Threshold | Criterion met? |
|--|-----------------|----------------|
| Chi-Square = 5.905; p value = .052 | p value > .05 | ✓ |
| Degrees of freedom = 2 | > 0 | ✓ |
| Relative Chi-Square = 2.952 | < 5.0 | ✓ |
| Goodness-of-fit index (GFI) = .983 | > = .9 | ✓ |
| Adjusted goodness-of-fit index (AGFI) = .916 | > = .9 | ✓ |
| Comparative fit index (CFI) = .986 | > = .9 | ✓ |
| Incremental fit indices (IFI) = .986 | > = .9 | ✓ |
| Normed fit index (NFI) = .979 | > = .9 | ✓ |
| Tucker Lewis index (TLI) = .958 | > = .9 | ✓ |
| Root mean square error of approximation (RMSEA) = .107 | < = .08 | (✓) |

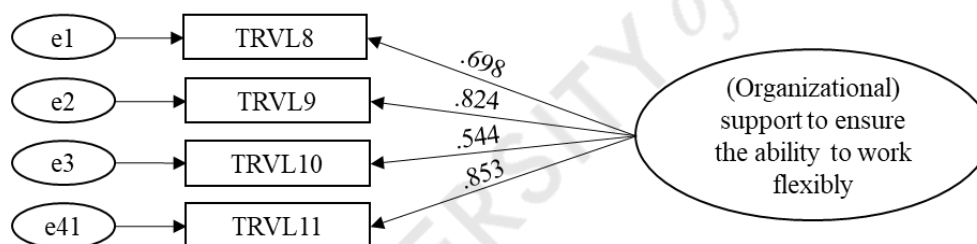
Therefore, the guideline from Hair, Black et al. (2019), calling for three, or preferably four, of the model fit indices was met. The RMSEA was only exceeded slightly which is

unproblematic for the CFA (Hair, Black et al., 2019). According to Kenny et al. (2015), RMSEA is associated with the degrees of freedom as well as sample size. The lower the degrees of freedom and the lower the sample size, the higher the RMSEA. However, a RMSEA exceeding the threshold (which also varies from .08 to .10) does not immediately indicate a bad model fit, if the other criteria are met. In this study, the degrees of freedom are rather low and the sample size is meeting the criteria for a CFA (explaining the RMSEA), but for an additional CB-SEM analysis the sample size would be classified as a medium sample (Kline, 2016). After that, the average variance extracted (AVE) has been calculated, which should be $AVE > .5$ (Hair, Black et al., 2019). In this case, the threshold was exceeded as the $AVE_{factor1} = .576$. Afterwards, the construct reliability (CR) has been calculated, which should exceed .7 (Hair, Black et al., 2019). This threshold was also met as the $CR_{factor1} = .843$. Thus, this scale is usable as a standalone scale.

The procedure has been repeated for the second factor ((Organizational) support to ensure the ability to work flexibly). In this case, three items (TRVL12, TRVL13, TRVL14) were again deleted one after another since the items had factor loadings $< .5$, leading to the factor as depicted in figure 5.6.

Figure 5.6: CFA result for Factor 2

Own depiction



Afterwards, the following model fit indices were achieved, leading to the same conclusion as for factor 1:

Table 5.74: CFA model fit indices for factor 2

Own table, indices based on Byrne (2016), Hair, Black et al. (2019) and Kline (2016)

| Criterion (desired result in brackets) | Threshold | Criterion met? |
|--|-----------------|----------------|
| Chi-Square = 4.975; p value = .083 | p value > .05 | ✓ |
| Degrees of freedom = 2 | > 0 | ✓ |
| Relative Chi-Square = 2.488 | < 5.0 | ✓ |
| Goodness-of-fit index (GFI) = .985 | > = .9 | ✓ |
| Adjusted goodness-of-fit index (AGFI) = .927 | > = .9 | ✓ |
| Comparative fit index (CFI) = .988 | > = .9 | ✓ |
| Incremental fit indices (IFI) = .989 | > = .9 | ✓ |
| Normed fit index (NFI) = .981 | > = .9 | ✓ |
| Tucker Lewis index (TLI) = .965 | > = .9 | ✓ |
| Root mean square error of approximation (RMSEA) = .093 | < = .08 | (✓) |

Therefore, the AVE and the CR have been calculated as well, leading to an $AVE_{factor2} = .548$ and a $CR_{factor2} = .825$, exceeding the thresholds as well. Thus, two factors have been established which can be used separately.

In the next step, a second order CFA was conducted in order to analyze if the two factors fall under one overarching higher-order factor. Thus, the two factors that have been analyzed previously, are now specified as endogenous constructs while the higher-order construct is the exogenous one (Hair, Black et al., 2019). Higher-order factors can generally be used if they are justified theoretically (Hair, Black et al., 2019), which is the case in this study. The analysis follows the same procedure as for the first order CFA, but with first-order factors as endogenous constructs (Hair, Black et al., 2019). The model has again been specified in AMOS, now as a higher-order model, cf. figure 5.7. The results indicate that all factor loadings are above .5, meeting the criterion. The model fit indices are displayed in table 5.8. The results indicate that two of the indices (Chi-square and AGFI) exceed the thresholds. If the number of indicators increases or if the sample size is rather small, the Chi-square can be significant and the AGFI does not meet the threshold for these reasons (Hair, Black et al., 2019). Therefore, researchers do not only focus on the Chi-square to evaluate a model and continue their analysis despite a non-significant Chi-square (Hair, Black et al., 2019). The RMSEA was only exceeded slightly which is again unproblematic for the CFA (Hair, Black et al., 2019). However, the recommendation from Hair, Black et al. (2019) to meet at least

three (or better four) criteria is fulfilled as seven criteria (eight if RMSEA is included) are met.

Figure 5.7: Second-order CFA in AMOS

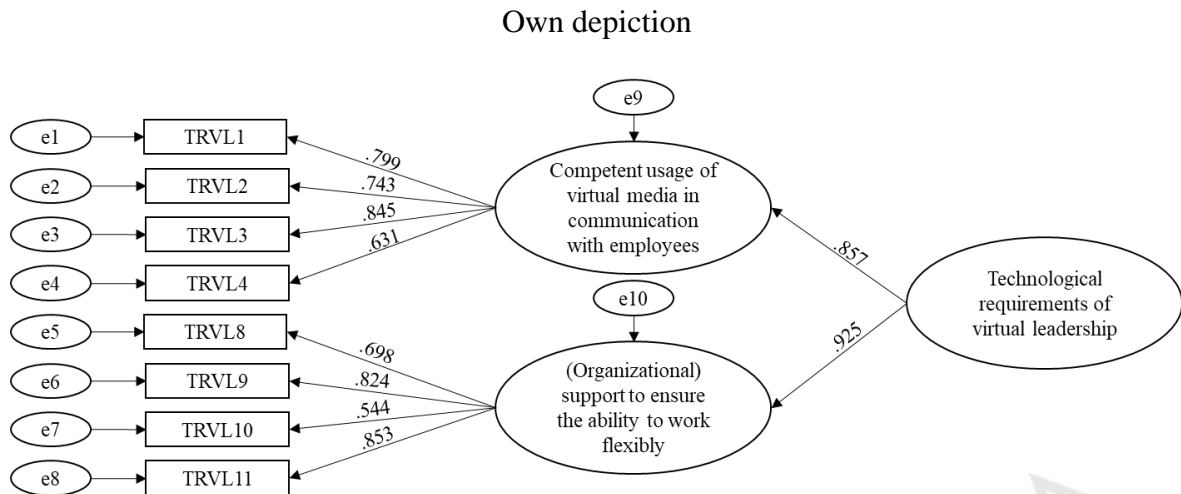


Table 5.8: Second-order CFA model fit indices

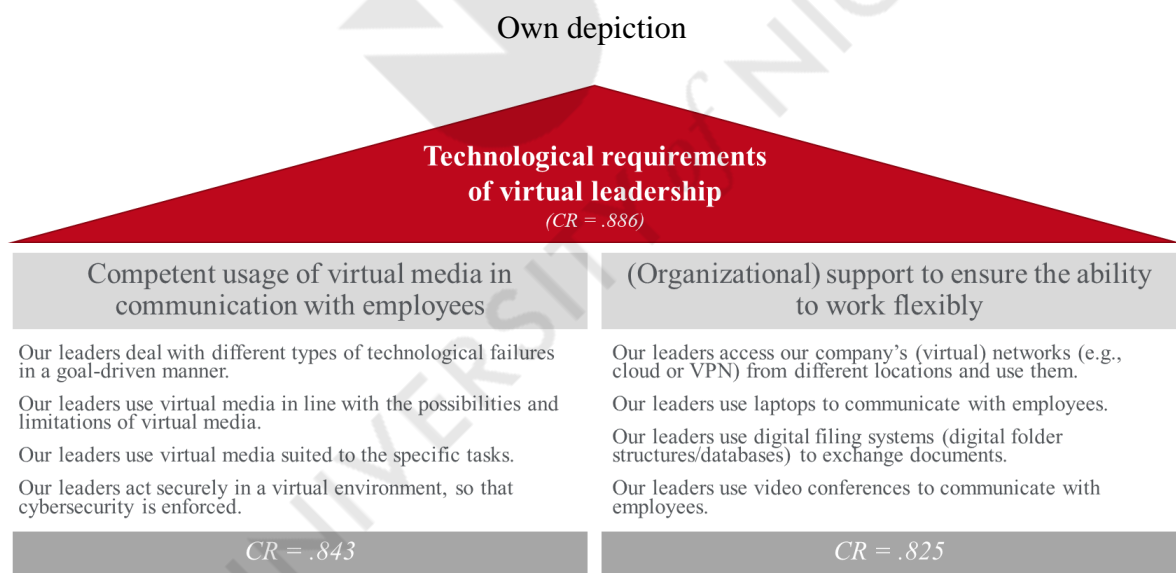
Own table, indices based on Byrne (2016), Hair, Black et al. (2019) and Kline (2016)

| Criterion | Threshold | Criterion met? |
|--|-----------------|----------------|
| Chi-Square = 42.162; p value = .002 | p value > .05 | ✗ |
| Degrees of freedom = 19 | > 0 | ✓ |
| Relative Chi-Square = 2.219 | < 5.0 | ✓ |
| Goodness-of-fit index (GFI) = .938 | > = .9 | ✓ |
| Adjusted goodness-of-fit index (AGFI) = .882 | > = .9 | ✗ |
| Comparative fit index (CFI) = .964 | > = .9 | ✓ |
| Incremental fit indices (IFI) = .965 | > = .9 | ✓ |
| Normed fit index (NFI) = .938 | > = .9 | ✓ |
| Tucker Lewis index (TLI) = .948 | > = .9 | ✓ |
| Root mean square error of approximation (RMSEA) = .084 | < = .08 | (✓) |

No further model adjustments have been made. In addition, the AVE and the CR have been calculated for the higher-order factor TRVL and both exceed the thresholds ($AVE_{higher-order factor} = .795$; $CR_{higher-order factor} = .886$). Thus, the higher-order as well as both lower-order factors have good convergent validity (AVE) and construct reliability (CR) scores. Therefore, a theoretically founded higher-order scale has successfully been established which is

usable for further quantitative analysis. The following figure 5.8 summarizes the new scale by depicting a house with a rooftop, symbolizing the new scale technological requirements of virtual leadership, based on two pillars (the lower-order factors); *competent usage of virtual media in communication with employees* as well as *(organizational) support to ensure the ability to work flexibly*. The first lower-order factor thus concentrates on being competent when using technology, especially in terms of communication with employees working flexibly. The second lower-order factor focuses on the organizational or the support from the leaders. This is operationalized by stating that leaders apply certain technology (like laptops or video conferences), implying that the organization supports them with the necessary hard- and software. As it is hardly measurable how well leaders are equipped, the application of those technologies is measured by assuming that the organization provided the necessary support beforehand. By staying in the metaphor of a house, the two pillars – and therefore the house – are based on solid concrete, which in this case is the construct of reliability of the lower-order factors.

Figure 5.8: Visualization of the validated *technological requirements of virtual leadership*



5.1.7 Interim conclusion

The result of the multi-method scale development procedure (item development, item sort task, pretest of substantive validity, EFA and CFA) is a new measurement instrument. This was derived from an objective research process, leading to a reliable and valid scale/construct. The construct is called *technological requirements of virtual leadership (TRVL)* and contains eight items in total, divided into two factors. These factors are called *competent usage of virtual media in communication with employees* and *(organizational) support to*

ensure the ability to work flexibly. The scale was finally validated through the CFA (CR = .886) and can now be used for further quantitative analysis. Thus, it will be implemented in the following structural equation modeling analysis in order to analyze its impact on other constructs.

Besides its implementation in the following quantitative study, it can be used further in different settings, like certain industries or larger companies. Thus, this constitutes an implication for further research, cf. chapter 6.5.

5.2 Structural equation modeling

The revised conceptual framework (cf. figure 4.2) will be analyzed quantitatively in this chapter by using partial least squares structural equation modeling (PLS-SEM). The new scale will immediately be applied in this study as it has been included in the revised conceptual framework. The analyses will be on organizational level since the newly developed scale requires organizational level research. Moreover, due to organizational level research, implications can be uncovered, accounting for the company rather than just for an individual, so the results are more general. In addition, a multi-level research design is not desired as this would probably hinder potential participants from filling in the whole questionnaire due to too many items. Thus, the research remains on organizational level, as the qualitative study also was conducted on an organizational level.

Therefore, this chapter is an enabler to answer RQ3, to achieve the aim as well as RO3 and RO4.

5.2.1 Development of hypotheses

The revised conceptual framework of workplace flexibility practices, transformational leadership, trust and intra-team communication on SME performance indicators (cf. figure 4.2) has, therefore, been revisited. As the development of the conceptual framework with its relationships among the constructs has been explained in detail in the earlier chapters, the hypotheses – derived from the literature – will briefly be summarized in this chapter. Moreover, the conceptual framework will now be called a model, since it will be researched quantitatively in this chapter.

The model for this quantitative study is an organizational level model, including all organizational level constructs from the conceptual framework. The constructs of trust and transformational leadership can either be measured on a team or organizational level. Therefore, these two constructs are – on the organizational level – also part of the model for this quantitative study. Finally, the technological requirements of virtual leadership – which itself is

an organizational level construct – is also implemented in the model, which is visualized in figure 5.8. The hypotheses development will now briefly be explained.

HR commitment practices express the commitment of an employer towards the employees, representing a motivation and performance enhancing practice (Arthur, 1994; Martínez-Sánchez, Pérez-Pérez et al., 2008; McClean and Collins, 2011; Whitener, 2001). So, through the use of HR commitment practices, employees are bound to a company (Collins and Smith, 2006; Tsui et al., 1997). Longer tenures increase performance due to employees' experience in the processes, even for monotonous tasks (Tirrel and Winnen, 2018). Prior research states that HR commitment practices enhance performance (Chen et al., 2017; Huselid, 1995; Latorre et al., 2016; McClean and Collins, 2011; Youndt et al., 1996). Moreover, HR commitment practices lead to an increase in working flexibility (i.e., internal numerical flexibility) because the employer states clearly towards the employees that they are free to work autonomously while having the same opportunities as employees that work within the company premises, such as potential promotions (Iverson, 1996; Martínez-Sánchez, Pérez-Pérez et al., 2008). Therefore, the following hypotheses are proposed:

H₁: HR commitment practices are positively related to firm-level employee performance.

H₂: HR commitment practices are positively related to internal numerical flexibility.

Due to procedural flexibility, employees can co-decide within a decision-making process, based on certain rules (Zapata-Phelan et al., 2009). This means that employees are not at the mercy of management's decisions, e.g., through dismissal, but are protected, which promotes company loyalty and thus performance (Addison and Teixeira, 2003; Tirrel and Winnen, 2018). Thus, procedural flexibility leads to more cooperative attitude as well as a superior work culture which finally enhances performance (Addison and Teixeira, 2003; Buultjens and Howard, 2001; Stewart and Spatz, 1993; Zapata-Phelan et al., 2009), proposing the following hypothesis:

H₃: Procedural flexibility is positively related to firm-level employee performance.

Since a high degree of functional flexibility is understood as a highly qualified and multi-skilled workforce, employees – who also participate in job design – more often have the opportunity to work from various locations (Desombre et al., 2006; Martínez-Sánchez, Pérez-Pérez et al., 2008). The flexibility firm theory supports it as motivation and retention are increased, resulting in higher outcomes (Chatterjee, Chaudhuri and Vrontis, 2022; Rodgers, 1992). In addition, a direct relationship to higher corporate performance has been uncovered in previous studies, as highly skilled employees are more productive (Martínez-Sánchez,

Pérez-Pérez et al., 2008; Whyman and Petrescu, 2015). Thus, the following hypotheses are proposed:

H4: Functional flexibility is positively related to internal numerical flexibility.

H5: Functional flexibility is positively related to firm-level employee performance.

Cost flexibility refers to various remuneration systems which can motivate and thus retain employees (Martínez-Sánchez, Pérez-Pérez et al., 2008; Whyman and Petrescu, 2015). Furthermore, a relationship between cost flexibility and internal numerical flexibility is indicated due to monetary motivation of employees (Martínez-Sánchez, Pérez-Pérez et al., 2008). Companies that tend to use cost flexibility also tend to use other flexibility practices, like internal numerical flexibility (Gittleman et al., 1998). Working at other locations also somehow feels like a reward, since employees decide where to work on their own, leading to them feeling privileged and lower costs (Lautsch et al., 2009; Mann et al., 2000). Due to its motivating aspects, a high degree of cost flexibility is associated with a high performance, being again in line with the flexibility firm theory (Chatterjee, Chaudhuri and Vrontis, 2022; Rodgers, 1992; Whyman and Petrescu, 2015). Thus, the following hypotheses are proposed:

H6: Cost flexibility is positively related to internal numerical flexibility.

H7: Cost flexibility is positively related to firm-level employee performance.

Workforces with a high degree of internal numerical flexibility can easily adapt to changes, e.g., by increasing their workload to due flexitime (Kok and Ligthart, 2014; Martínez-Sánchez et al., 2011; Martínez-Sánchez, Vela-Jiménez et al., 2008). Moreover, working at various locations can also provide a certain degree of autonomy to employees, which has a motivating effect as pointed out by the flexibility firm theory (Chatterjee, Chaudhuri and Vrontis, 2022; Rodgers, 1992). Therefore, “flexibility [...] provides a concrete lever to organizations for enhancing organizational performance” (Grzywacz et al., 2008, p. 200). Thus, the following hypothesis is proposed:

H8: Internal numerical flexibility is positively related to firm-level employee performance.

External numerical flexibility refers to adjusting the workforce size quickly through the use of temporary or fixed-term employee or lay-offs (Martínez-Sánchez, Vela-Jiménez et al., 2008). Internal employees fear to be replaced by a more flexible workforce (Boyce et al., 2007) while temporary employees are associated with lower levels of trust due to counter-productive behavior (Posthuma et al., 2005; Svensson, 2012; Voudouris et al., 2017).

Moreover, the performance seems to decrease when the degree of external numerical flexibility is high due to higher degrees of fluctuation and lower degrees of commitment (Allen and Meyer, 1990; Kulkarni and Ramamoorthy, 2005; Martínez-Sánchez, Pérez-Pérez et al., 2008; Michie and Sheehan, 2005; Posthuma et al., 2005). However, according to Connelly and Gallagher (2004), transformational leadership might moderate this relationship because fixed-term or temporary employees, as well as core-employees, need to be led and motivated in order to perform well. Furthermore, a transformational leader can enhance the employee performance by caring for temporary employees. Thus, the following hypotheses are proposed:

H₉: External numerical flexibility is negatively related to firm-level employee performance.

H₁₀: External numerical flexibility is negatively related to trust.

H₁₆: Transformational leadership climate moderates the nexus between external numerical flexibility and firm-level employee performance positively.

Trust seems to be an important factor when working flexibly, because if distrust exists, leaders and co-workers equate flexible work with holidays (Nordbäck et al., 2017). Therefore, leaders have to create a trustful working environment which is more difficult to set up in a virtual environment as face-to-face contact and social control are lacking (Cascio, 2000; Jarvenpaa et al., 1998; Nordbäck et al., 2017). However, trust glues the flexible workforce together to one unit (Crisp and Jarvenpaa, 2013). Moreover, trust also affects performance indicators directly as employees are anticipated to work in a certain manner which is led by the trustor (leader) (Crisp and Jarvenpaa, 2013; Mayer et al., 1995). In addition, the leader expects that employees are also willing to achieve the company's aim(s) and therefore behave in a way that supports reaching these goals (Jarvenpaa et al., 1998). Therefore, the following hypotheses are proposed:

H₁₁: Trust is positively related to internal numerical flexibility.

H₁₂: Trust is positively related to firm-level employee performance.

In addition to the aforementioned hypotheses, transformational leadership enhances trust, which is more complex when leading a group as there are several trustees (Jarvenpaa et al., 1998; Podsakoff et al., 1990). Trust is often studied as a mediating construct between transformational leadership and performance indicators, suggesting that transformational leadership fosters trust as well as performance (Braun et al., 2013; Jena et al., 2018; Podsakoff et al., 1990; Yukl, 1989). In addition, transformational leadership is an antecedent of working

flexibly (Mesu et al., 2013). The interviews (cf. chapter 4) also uncovered that transformational leadership with its key leadership behaviors is understood as an enabler for working flexibly. If leaders use flexibility to a certain degree, they communicate nonverbally to their employees that they might also use flexibility (leader as a role model with their followers). As this study will be conducted at the organizational level, transformational leadership climate (within a company) is used instead of measuring transformational leadership behaviors of a certain leader, which would have induced research on the individual or team-level. So, transformational leadership climate serves as a proxy for transformational leadership (more information on transformational leadership climate follow in chapter 5.2.2.1.3). Therefore, the following hypotheses are proposed:

H₁₃: Transformational leadership climate is positively related to internal numerical flexibility.

H₁₄: Transformational leadership climate is positively related to firm-level employee performance.

H₁₅: Transformational leadership climate is positively related to trust.

H₁₇: Trust mediates the nexus between transformational leadership climate and firm-level employee performance positively.

The interviews uncovered that technology affects the leadership. Interviewee 12 pinpointed this aspect by stating “That means, my leadership actually fails because of the technology. And that is a huge problem for me”. This underlines that leaders depend on technology, especially when leading employees that work flexibly. In general, transformational leadership is capable of using technology for communicating with employees (Men, 2014). However, even transformational leaders are hindered when technology does not work or people are not trained to use it, as highlighted by the interviewees. Recent literature also discusses the influence of technology on leadership and concludes that communication flows might be interrupted (Chen et al., 2021; Cowan, 2014; Darics, 2020; Hou, 2020; Sharpp et al., 2019). In contrast, technology can also support leaders if both (leaders and employees) are well equipped with it and know how to use it (Kingma, 2016). Leaders also look to the future with high expectations and want technology to better support them:

“And that is actually the goal. I want to have tools, I want to have IT that makes work fun and that will perhaps in the future also take things off my hands via artificial intelligence, that simply help me to track things, to track processes” (I8).

This comes in line with the understanding that technology is a resource according to the job demands-resources model (Bakker and Demerouti, 2007; Xanthopoulou et al., 2007). Resources increase motivation (Bakker and Demerouti, 2007; Xanthopoulou et al., 2007) and therefore this resource is associated with leadership. Thus, technology does not only intervene in the relationship between transformational leadership climate and internal numerical flexibility. It also intervenes on the nexus between transformational leadership climate and trust as well as firm-level employee performance because both are representing an outcome of high-quality leadership.

As no construct could be identified, covering these technological influences, the technological requirements of virtual leadership was developed (cf. chapter 5.1). This construct will probably positively moderate, i.e., intervene, the relationships between transformational leadership (in these cases transformational leadership) and its associated dependent constructs. Thus, the self-developed innovative Technological Scale of Virtual Leadership is expected to moderate the nexuses between transformational leadership climate and internal numerical flexibility, firm-level employee performance as well as trust, leading to the following proposed hypotheses:

H₁₇: Technological requirements of virtual leadership moderates the nexus between transformational leadership climate and internal numerical flexibility positively.

H₁₈: Technological requirements of virtual leadership moderates the nexus between transformational leadership climate and firm-level employee performance positively.

H₁₉: Technological requirements of virtual leadership moderates the nexus between transformational leadership climate and trust positively.

Finally, the studies from Jiang et al. (2012) as well as Ketkar and Sett (2009) highlights that firm-level employee performance affects operational performance. Moreover, operational performance is also associated with financial performance. Therefore, the following hypotheses are proposed:

H₂₀: Firm-level employee performance is positively related to operational performance.

H₂₁: Operational performance is positively related to financial performance.

In this study, five control variables will be evaluated. Company size (i.e., number of employees) is associated with financial performance as larger companies typically do have an HRM department and can use scale effects according to costs (Roca-Puig et al., 2012). Therefore, financial performance is anticipated to be larger in bigger companies. Company

age (2022 minus the year in which the company was founded (Delaney and Huselid, 1996)) is also expected to be related to financial performance since older companies do have established internal structures which might again influence the financial performance. The type of industry (service or a manufacturing company, dummy variable) is also ascertained and is linked to financial performance since one industry type might influence the performance more than another. Absenteeism and employee turnover are associated with operational as well as financial performance since both are accompanied with lower social interaction (Ployhart and Moliterno, 2011). Although these two variables have also been used as performance measures (cf. Whyman and Petrescu (2015)), they have been integrated as control variables due to criticism of that performance measurement. However, they are relevant from an HRM perspective and thus integrated in the model.

Since, on the one hand, content already discussed in previous chapters should not be repeated at this stage, but, on the other hand, the hypotheses derived from the literature for this quantitative study should be presented, they and their empirical basis have been discussed briefly and are summarized in the following table 5.9.

Table 5.9: Overview of hypotheses and their empirical basis

Own table

| No. | Hypothesis | Empirical basis |
|----------------|--|---|
| H ₁ | HR commitment practices are positively related to firm-level employee performance. | Chen et al. (2017), Huselid (1995), Latorre et al. (2016), McClean and Collins (2011), Youndt et al. (1996) |
| H ₂ | HR commitment practices are positively related to internal numerical flexibility. | Iverson (1996), Martínez-Sánchez, Pérez-Pérez et al. (2008) |
| H ₃ | Procedural flexibility is positively related to firm-level employee performance. | Addison and Teixeira (2003), Stewart and Spatz (1993), Zapata-Phelan et al. (2009) |
| H ₄ | Functional flexibility is positively related to internal numerical flexibility. | Martínez-Sánchez, Pérez-Pérez et al. (2008), Whyman and Petrescu (2015) |

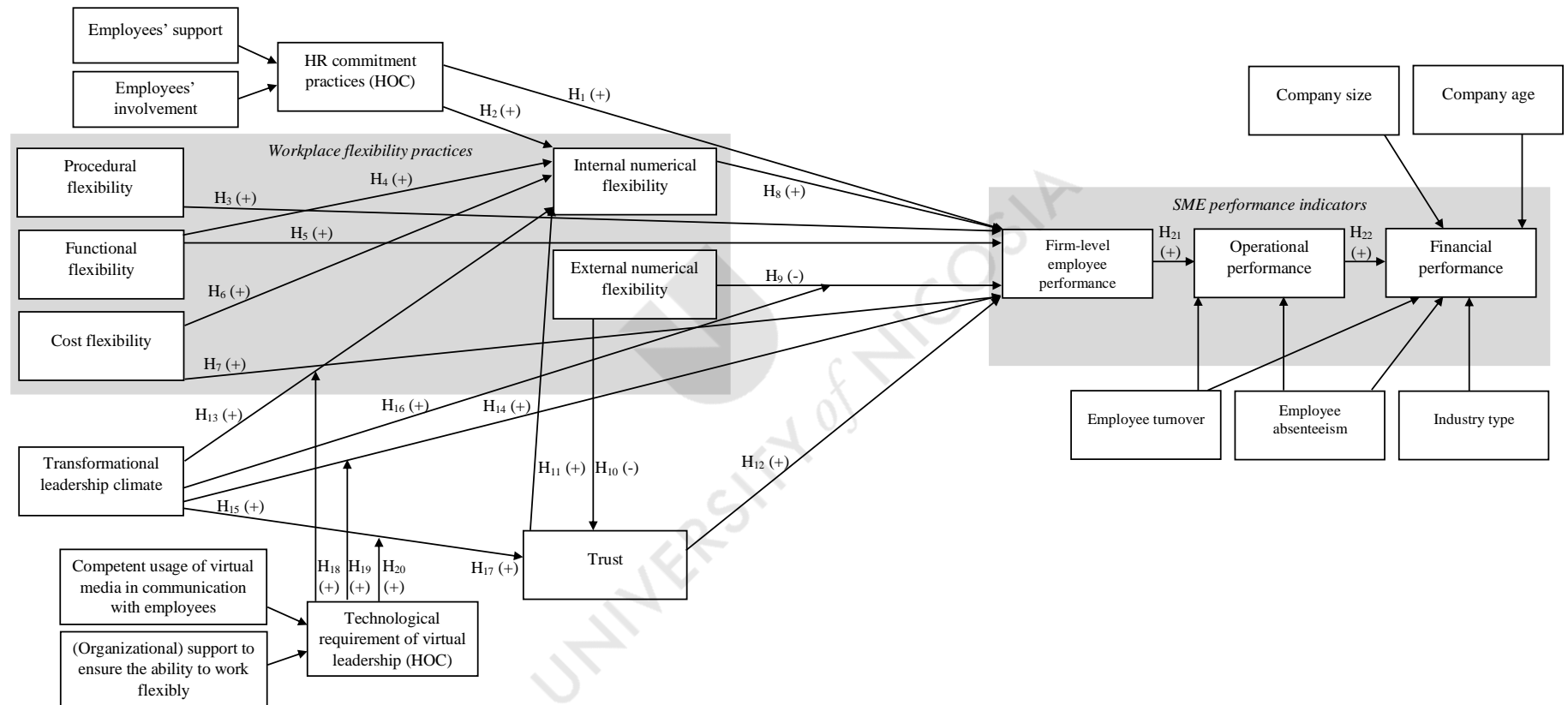
| | | |
|-----------------|--|---|
| H ₅ | Functional flexibility is positively related to firm-level employee performance. | Martínez-Sánchez, Pérez-Pérez et al. (2008), Whyman and Petrescu (2015) |
| H ₆ | Cost flexibility is positively related to internal numerical flexibility. | Martínez-Sánchez, Pérez-Pérez et al. (2008) |
| H ₇ | Cost flexibility is positively related to firm-level employee performance. | Whyman and Petrescu (2015) Grzywacz et al. (2008), Martínez-Sánchez, Pérez-Pérez et al. (2008), Whyman and Petrescu (2015) |
| H ₈ | Internal numerical flexibility is positively related to firm-level employee performance. | Martínez-Sánchez, Pérez-Pérez et al. (2008), Posthuma (2005), Whyman and Petrescu (2015) |
| H ₉ | External numerical flexibility is negatively related to firm-level employee performance. | Svensson (2012), Voudouris (2017) |
| H ₁₀ | External numerical flexibility is negatively related to trust. | Jarvenpaa et al. (1998), Nordbäck et al. (2017) |
| H ₁₁ | Trust is positively related to internal numerical flexibility. | Crisp and Jarvenpaa (2013), Mayer et al. (1995), Podsakoff (1990) |
| H ₁₂ | Trust is positively related to firm-level employee performance. | Mesu et al. (2013) |
| H ₁₃ | Transformational leadership climate is positively related to internal numerical flexibility. | Moon (2016), Podsakoff (1990), Van Wart (2019) |
| H ₁₄ | Transformational leadership climate is positively related to firm-level employee performance. | Braun et al. (2013), Jena et al. (2018), Podsakoff et al. (1990), Yukl (1989) |
| H ₁₅ | Transformational leadership climate is positively related to trust. | Connelly and Gallagher (2004) |
| H ₁₆ | Transformational leadership climate moderates the nexus between external numerical flexibility and firm-level employee performance positively. | |

| | | |
|-----------------|--|---|
| H ₁₇ | Trust mediates the nexus between transformational leadership climate and firm-level employee performance positively. | Braun et al. (2013), Jena et al. (2018), Podsakoff et al. (1990), Yukl (1989) |
| H ₁₈ | Technological requirements of virtual leadership moderates the nexus between transformational leadership climate and internal numerical flexibility positively. | Own hypothesis based on the qualitative study and the job demands-resources model (Bakker and Demerouti, 2007; Xanthopoulou et al., 2007) |
| H ₁₉ | Technological requirements of virtual leadership moderates the nexus between transformational leadership climate and firm-level employee performance positively. | Own hypothesis based on the qualitative study and the job demands-resources model (Bakker and Demerouti, 2007; Xanthopoulou et al., 2007) |
| H ₂₀ | Technological requirements of virtual leadership moderates the nexus between transformational leadership climate and trust positively. | Own hypothesis based on the qualitative study and the job demands-resources model (Bakker and Demerouti, 2007; Xanthopoulou et al., 2007) |
| H ₂₁ | Firm-level employee performance is positively related to operational performance. | Jiang et al. (2012), Ketkar and Sett (2009) |
| H ₂₂ | Operational performance is positively related to financial performance. | Jiang et al. (2012), Ketkar and Sett (2009) |

The model under research, including all the aforementioned hypotheses, is depicted in the following figure 5.9.

Figure 5.9: Model of workplace flexibility practices, transformational leadership climate, trust and HR commitment practices on SME performance indicators

Own depiction (signs in brackets indicate the direction of the relationship; + = positive, - = negative)



5.2.2 Development and pretest of a questionnaire

As depicted in the model (cf. figure 5.9) this study will be a study on organizational level, therefore, the constructs were selected based on existing organizational level scales. These scales will be discussed briefly. Afterwards, the translation process of items is discussed before the scale design is described in this chapter. The order of constructs as well as items in the questionnaire is highlighted. This chapter ends with the pretest of the developed questionnaire.

5.2.2.1 Measures

All the constructs with its items – the scales – have been developed and used by other researchers who also validated them, with the exception of the technological requirements of virtual leadership construct. Therefore, the used wordings in the questionnaire are already predefined. The scales and its items are included in the appendix XIV. Sample items will be presented in the following paragraphs.

5.2.2.1.1 SME performance indicators

There is a long-running discussion on how to measure performance in (S)HRM research (cf. chapters 2.3.3.1.1 and 4.5) as there are different types of organizational performance discussed in the literature, i.e., HR performance, operational and financial performance (Jiang et al., 2012). Since the interviewees highlighted the need to enhance the performance measures (and therefore criticized Whyman and Petrescu's (2015) choice), the aforementioned types will now be discussed and used for this model.

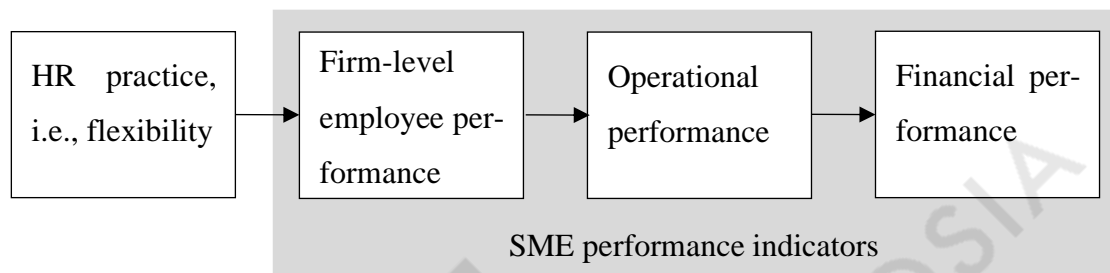
Employee performance on organizational level typically focuses on low absenteeism as well as turnover rates, employee motivation or job performance, while operational performance concentrates on productivity, quality, service or innovation (Aragón-Sánchez et al., 2003; Jiang et al., 2012; Ngo et al., 2008; Tharenou et al., 2007). Financial performance is typically operationalized as return on assets, sales growth, profit or return on investment (Jiang et al., 2012; Ngo et al., 2008; Tharenou et al., 2007).

These three performance types are in sequence and typically viewed as the result of an HR practice, like in this case flexibility (Dyer and Reeves, 1995; Tharenou et al., 2007). Moreover, firm-level employee performance is also associated directly with financial performance (Jiang et al., 2012). Studies in the field of HRM often focus on operational and financial performance, but less often on HR performance despite the underlying nexus of the triptych (Dyer and Reeves, 1995; Jiang et al., 2012; Tharenou et al., 2007). This triptych is depicted in figure 5.10, visualizing that firm-level employee performance is related to operational

performance and that operational performance is associated with financial performance. A fourth option for publicly traded companies is stock market performance, i.e., shareholder return or stock value (Dyer and Reeves, 1995) but companies being publicly held is not expected to be the case in researching SMEs. Therefore, it is not considered in more detail here.

Figure 5.10: Theoretical linkage of SME performance indicators

Own depiction, derived from Dyer and Reeves (1995), Jiang et al. (2012), Ketkar and Sett (2009) and Tharenou et al. (2007)



Due to this, the triptych is replacing the SME performance indicators in the model (cf. figure 5.9) to meet the comments of the interviewees and the requirements of a complex measurement of performance indicators.

In order to measure SME performance, the three developed scales from Ketkar and Sett (2009) will be used, namely firm-level employee, operational and financial performance. Thus, the German version of the scales (after a back-translation, cf. Winnen (2015)) is implemented in the questionnaire and the time frames are standardized to 12 months, i.e., the usual time frame for organizational performance research (Ngo et al., 2008; Whyman and Petrescu, 2015), so they are equal and comparable. These three performance scales (Cronbach's alpha value of more than .6 and a composite reliability of more than .7) are used with sample items like *organizational commitment* and *output per employee* (firm-level employee performance), *customer satisfaction level* and *efficiency of operations* (operational performance) as well as *growth of sales revenue* and *profitability (profit/sales)* (financial performance) (Ketkar and Sett, 2009, p. 1038).

5.2.2.1.2 Workplace flexibility practices

Now the five workplace flexibility practices will be discussed.

5.2.2.1.2.1 Internal numerical flexibility

The construct used in this study will rather follow the one used by Whyman and Petrescu (2015) because it covers several workplace flexibilities (instead of solely telework like the construct from Martínez-Sánchez, Pérez-Pérez et al. (2008)) on the one hand. On the other, it was designed for a study focusing on SMEs (Whyman and Petrescu, 2015). However, the scale has two weaknesses; first, scale reliability, e.g., Cronbach's alpha, is not provided so this remains unclear, second, the aspects of working from home and mobile work have been combined in one item although these two places are different according to the definition of Oldenburg (2001; 1999) and Oldenburg and Brissett (1982). Therefore, the flexibility scale from Poethke et al. (2019) will be applied as this has a Cronbach's alpha of .75 which is interpreted as very well-founded as they are above .7 (Field, 2018; Saunders et al., 2016), while above .8 would indicate an even higher reliability (Bryman, 2016; Field, 2018). Moreover, it covers flexibility in terms of places (home office as well as third workspaces) and times (Poethke et al., 2019). This construct contains five items and was developed in German, so a German version of the scale is available (Poethke et al., 2019). However, the scale has one weakness as it provides additional information regarding the flexibility of locations in brackets, starting with at home. But there is a single item focusing on work from home, so there is an overlap which could lead to misunderstandings and very high item-correlations. In order to circumvent misunderstandings and to express as precisely as possible, the examples in brackets have been enhanced and restructured as follows: on the road, on the train, with the customer, at home. Therefore, working flexibly is in the foreground (not only work from home, which is one kind of working flexibly). The English versions¹⁴ of the items have been generated, but the original German version will be used with sample items like "The employees of our company reply to work emails even when they are not in the office (e.g., on the road, on the train, at the customer, at home)" (Poethke et al., 2019, p. 138).

5.2.2.1.2.2 External numerical flexibility

The construct of external numerical flexibility is operationalized by Martínez-Sánchez, Vela-Jiménez et al. (2008) through three items, namely temporary employees, fixed-term employees and lay-offs. The scale has a Cronbach's alpha value of .721 (Martínez-Sánchez, Vela-Jiménez et al., 2008). As the original scale uses percentages, e.g., how many percent of employees are fixed-term, the items will be slightly reformulated in order to use a seven-

¹⁴ The translation procedure will be explained in chapter 5.2.2.2.

point Likert interval scale (interval scales with the same number count are required for SEM (Hair et al., 2017)), ranging from 0 (strongly disagree) to 6 (strongly agree).

5.2.2.1.2.3 Functional flexibility

In the study by Whyman and Petrescu (2015) which focuses on SMEs, the construct contains the following items: “teamworking; or employee job autonomy; or employee involvement in decision-making”, “training staff to increase their current skills; or job enrichment (training staff to do jobs other than their main job)”, “employee job security” and “job sharing” (Whyman and Petrescu, 2015, p. 1124-1125). This scale was measured binary (one = yes; zero = no), but no Cronbach’s alpha was presented (Whyman and Petrescu, 2015). A study conducted by Martínez-Sánchez, Vela-Jiménez et al. (2008) contained comparable items, as they measured if multi-skilled or problem and quality solving teams, job rotation, involvement of employees in job planning and design as well as total quality management was applied (Cronbach’s alpha = .756). As the study from Martínez-Sánchez, Vela-Jiménez et al. (2008) presents a well-founded alpha value and is already established as a scale on an organizational level, it will be used in this study. The original scale used percentages, i.e., how many percent of employees used job rotation, while in this study a seven-point Likert scale will be used, as interval scales with the same number count are required for SEM. One sample item refers to the degree of a multi-skilled team (Martínez-Sánchez, Vela-Jiménez et al., 2008).

5.2.2.1.2.4 Procedural flexibility

A scale to measure procedural flexibility on organizational level was developed by Colvin (2006) which covers hiring flexibility, firing flexibility and grievance procedures. The items to measure hiring and firing flexibility are measured on a seven-point Likert scale from disagreeing strongly (one) to agreeing strongly (seven) (Colvin, 2006). In contrast to these items, the item “Non-union grievance procedures” questions whether they do (not) exist in a binary measurement (one = yes, zero = no). Due to this, that item needs to be reworked as an interval scale with the same number count is required for an appropriate usage with SEM (Hair et al., 2017).

5.2.2.1.2.5 Cost flexibility

Cost flexibility is operationalized on an organizational level and concentrates on management pay or bonus cut, management pay-freeze, or management voluntarily waives bonus as well as commission pay concerning the management (Whyman and Petrescu, 2015). Regarding the employees, the scale focuses on a pay-freeze, performance-related individual

remuneration and a company profit related pay (Whyman and Petrescu, 2015). Both perspectives (management and employees) describe a broader variety of remuneration systems than only (in)direct compensation (Whyman and Petrescu, 2015). This construct will again be measured on a seven-point Likert scale ranging from disagree strongly (0) to agree strongly (6), in order to fulfill the criteria of an interval scale for SEM (Hair et al., 2017). Since the survey will take place in Germany, the items management pay-freeze and staff pay-freeze will be deleted as it is – due to the German law – not possible to simply stop paying employees. Moreover, it is not common for managing directors to freeze their salaries. The items are formulated too drastically for a study in Germany. Accordingly, the scale has been shortened.

5.2.2.1.3 Transformational leadership climate

Transformational leadership is often measured by applying the transformational leadership inventory from Podsakoff et al. (1990) on an individual- or team-level (in comparison to the self-ratings of leaders (Ramsey et al., 2017)). Since this is a study on organizational level, the scale developed from Oberfield (2014) will be applied as it captures the transformational leadership climate within a company (Moon, 2016). Recent literature on leadership underlines that leadership climate is an organizational issue (Kunze et al., 2016; Menges et al., 2011). Thus, transformational leadership climate serves as a proxy as it is positively related to organizational-level performance constructs, like job satisfaction or extra-role behavior (Kunze et al., 2016; Menges et al., 2011; Moon, 2016). The items of Oberfield's (2014) construct are close to the definition from Bass (1985) as it contains the four I's, i.e., idealized influence, individualized consideration, inspirational motivation and intellectual stimulation (Oberfield, 2014). Cronbach's alpha values for this scale range from .87 to .88 in Moon's (2016) study and even from .92 to .95 in Oberfield's (2014) study. Therefore, transformational leadership climate will be measured by applying the four question-scale from Oberfield (2014, p. 418) for which "My organization's leaders maintain high standards of honesty and integrity" is a sample item.

5.2.2.1.4 Trust

Podsakoff et al. (1990) identified that trust is a mediating construct between transformational leader behavior and organizational citizenship behavior. But Podsakoff et al. (1990) asked employees to rate the trust in their leaders. Measuring trust is often done on an individual- or team-level study (Jain and Sinha, 2005). As this study is researching the trust on company level, the trust questionnaire developed by Robinson and Rousseau (1994) which is "derived from the bases of trust" as discussed by Gabarro and Athos (1976) is used. This scale focuses

on “an employer’s intentions and good will” (Jain and Sinha, 2005, p. 266). The trust questionnaire captures the foundation of trust in the context of business relations, so that violations of these relationships lead to distrust (Robinson and Rousseau, 1994). In this regard, stable and long-lasting relationships foster trust (Gabarro, 1978). Although this seven-item scale has already been developed in 1994, it is still used by researchers (e.g., Tan and Tan, 2000; Yates, 2020) as it measures trust on an organizational level and achieves Cronbach’s alpha values of .81 (Jain and Sinha, 2005) or .93 (Robinson and Rousseau, 1994). One sample item is “My employer is not always honest and truthful (reverse score)” (Robinson and Rousseau, 1994, p. 251).

After the back-translation, the item “I don’t think my employer treats me fairly” (Robinson and Rousseau, 1994, p. 251) has been reformulated since the German reverse coded version is hard to understand. In order to remedy misunderstandings, the item will be used in a non-reversed version.

5.2.2.1.5 Technological requirements of virtual leadership

The self-developed construct with its two factors (cf. chapter 5.1.7) will be used for this study. It has sufficient Cronbach’s alpha values and there is no alternative scale available. Furthermore, it is developed for organizational level studies. In contrast to the other constructs, this scale will firstly be validated through a confirmatory factor analysis. This might change the number of items included in the two factors. So, 14 of the 15 items identified in the EFA are included in the questionnaire (one was deleted due to a technical problem) in order to conduct a CFA. As a consequence, the number of items used for structural equation modeling might be lower, if the CFA leads to elimination of items.

5.2.2.1.6 HR commitment practices

The scale to measure HR commitment practices is based on the higher order construct HR commitment practices from the model by Martínez-Sánchez, Pérez-Pérez et al. (2008) which contains two lower order constructs called employees’ support as well as employees’ involvement. The presented Cronbach’s alpha values for the used scales (lower order constructs) are .869 for employees’ support and .770 for employees’ involvement (Martínez-Sánchez, Pérez-Pérez et al., 2008). One sample item is “We provide training focused on team building, teamwork skills and new information technologies” (Martínez-Sánchez, Pérez-Pérez et al., 2008, p. 21).

5.2.2.1.7 Control variables

As commonly done in quantitative research, as well as in this study, control variables will be generated (Creswell, 2014). First, it is intended to be able to differentiate companies into either SMEs or large companies, since this study focuses on SMEs. Matejun (2017) developed criteria in order to differentiate companies according to their specificity but did not validate these criteria. Therefore, the definition of the European Commission (2015; 2003) (cf. chapter 1.2.4) is typically used (in total or parts of it) to evaluate whether or not a company is classified as an SME (e.g., Jun et al., 2021; Schlichter et al., 2018), or another regional classification is applied, such as Canada's SME definition used by Zhu et al. (2021). As this study takes place in Germany, belonging to Europe, the definition of the European Commission will be incorporated in the questionnaire. As a consequence, it is possible to identify if a company is an SME or a large company, based on the data.

Second, the distribution of the sample into the different industries is measured in order to describe the sample (Jun et al., 2021). For this reason, the industries are differentiated according to the classification of the German Federal Statistical Office (Statistisches Bundesamt, 2008). Moreover, a differentiation according to the industry type is implemented by asking participants to rate if they are a service or a manufacturing company (Winnen, 2015).

Third, the company age is evaluated as recommended by Schlichter et al. (2018) since it affects profitability and growth (Coad et al., 2018). Company age is measured via the years of existence since the company was founded (startup) (Schlichter et al., 2018).

Fourth, the position of the respondent within the company needs to be filled in order to ensure that only (company) leaders are part of the intended sample, representing their company.

Fifth, tenure will be evaluated in order to identify how long a person is working for the current company. These two criteria are socio-demographic variables regarding the participant.

Sixth, in order to ensure that one company only participates once in this survey, anonymous information on the company is generated, i.e., the first number of the postal code, the first letter of the street's name of the company and the first three letters of the company's name, quantified based on a table (Winnen, 2015). This creates a company-ID that guarantees anonymity but still excludes double incorporation in the questionnaire. In the end, it is ensured that one company is not overrepresented which might influence the results.

5.2.2.2 Translation of items

Referring to Brislin (1986), it is important to have (new) items translated correctly and close to the initial language. Therefore, the wordings in the new and the original language must be very similar. In order to achieve a valuable result, the so-called back-translation procedure is recommended in which the items will be translated from the original language to the intended language by a bilingual translator. Afterwards, the translated items will be translated from the intended language back to the original language from another bilingual translator. This procedure can be repeated, if the results differ in order to finally achieve a true and usable instrument (Chen, H. and Boore, 2009). If certain formulations remain after this procedure, the wording is very close (or even similar) (Brislin, 1986). If certain formulations differ, these should be discussed with the translators since wordings might be lacking in another language (Brislin, 1986). Even if researchers are bilinguals, they should not translate and back-translate the items on their own because researchers are rarely experts regarding the target language of the desired sample (Brislin, 1986). Furthermore, the translator's background is important in order to ensure that both languages are spoken well (Chen and Boore, 2009).

In this study, the following steps are used to ensure a high-quality translation of the items. First, professional translators, a postgraduate student of English as well as a PhD student located in Australia are identified as translators. Two translators focus on the translation from German to English and vice versa. The postgraduate student will become an English teacher and the PhD student is a German native speaker, but has lived in Australia for several years. Based on their vita, they are very experienced in both languages which ensures that very good results can be expected.

Second, one of the translators receives a list with the items. These are either in English or in German, depending on in which language the construct with its items was developed. A translation from German to English is not mandatory, as the survey will be conducted in Germany. However, on the one hand, the author would like to conduct and report his study in a transparent and replicable manner, and on the other hand, he would like to make his self-developed scale (technological requirements of virtual leadership) accessible to international researchers, which is why an English-language version is necessary.

Third, the second translator receives the translations of the first translator and is asked to translate the items in the original language. The second translator was not involved in the first translation, in order to ensure an independent translation.

Fourth, the researcher compares the original items with the back-translated ones. If the translations were not very close or even identical to the original version, these have been discussed with a translator in order to circumvent problematic translations. Thereafter, minor adjustments have been made to align the translations as accurately as possible and to be as close as possible to the original wording.

Fifth, the items have been discussed with a German- and English-speaking professor to finally validate the translated items. Slight adjustments have been made in order to underline the organizational level within the items. Additionally, misunderstandings due to the German version have been eliminated as well. Thereafter, the items will finally be used for the questionnaire.

5.2.2.3 Scale design

The aforementioned constructs originally used different scale designs. Technological requirements of virtual leadership, for instance, was designed as a seven-point Likert scale, while trust and transformational leadership climate were measured by a five-point Likert scale (Oberfield, 2014; Robinson and Rousseau, 1994). The different lengths of the scales should be standardized as they will be implemented in a single questionnaire. Colman et al. (1997) state that it is possible to rearrange the lengths of scales as 85 % of the variance are explained after the realignment. In general, a seven-point Likert scale was identified to have a better reliability and validity in comparison to scales with fewer categories (Preston and Colman, 2000). Therefore, in this study all the measures will be done by using a seven-point Likert scale. SEM requires scales to be metric (interval or ratio) (Hair et al., 2022), but “when a Likert scale is perceived as symmetric and equidistant, it will behave more like an interval scale” (Hair et al., 2017, p. 10). Therefore, all scales are displayed uniformly and with labelled extrema ranging from 0 = totally disagree to 6 = totally agree (similar to the questionnaire developed for the EFA, cf. chapter 5.1.5). Every part containing items that belong to a certain construct start with a brief introduction in which participants are asked to respond with regard to their employer, leading to more clarity for the respondents (Porst, 2014). The items are always displayed on the left side, while the Likert scales are always on the right. Moreover, participants have the possibility to tick the option that they cannot answer the questions, placed next to the Likert scale. Figure 5.11 presents an excerpt as an example of the questionnaire. All items used are attached in appendix XIV).

Figure 5.11: Excerpt of the questionnaire with implemented seven-point Likert scale
Own depiction, translated English version, visualized via SoSci Survey (Leiner, 2019)

Please answer the following statements about the technological requirements of virtual leadership in relation to your company.

| | strongly disagree | 0 | 1 | 2 | 3 | 4 | 5 | 6 | strongly agree | cannot answer |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Our leaders use an intranet to provide employees with information. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Our leaders operate confidently in a virtual environment to ensure cyber security. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Our leaders have access to stable internet connection at their work locations/during their working hours. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Our leaders deal with different types of technological failures in a goal-driven manner. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

5.2.2.4 Order of constructs and items

In order to provide a logical order to the participants, items will always be aligned with their constructs for keeping up the concentration of the participants (Porst, 2014). This questionnaire contains 100 items, so a good structure is helpful in order to generate a high degree of fully filled questionnaires and a low dropout rate (Porst, 2014). Although all items belonging to a construct are presented together, the order of the items is random, preventing potential order effects (Lavrakas, 2008). For keeping respondents informed about their progress, a bar will indicate it visually on each page.

The questionnaire begins with a cover letter including a motivational story on the topic, a note that it is important to answer every question as well as a note that the results can be made available after the survey is completed, following the recommendations from Podsakoff et al. (2012). Afterwards, participants have to agree on formal criteria of ethical research, i.e., voluntary participation, information about anonymity, being able to ask questions to the researcher in case of a lack of clarity and being of legal age. This ensures ethically correct research, for which an ethical clearance certificate has been obtained. The questionnaire continues with the constructs (which are also randomly ordered), but items are displayed grouped (and randomly ordered within the group) by construct (Porst, 2014). The ten control variables follow after the constructs. Afterwards, participants are asked to provide personal information on the position and job tenure as well as anonymous information on their employer (for the company ID to help circumvent overrepresentation of one company (Winnen, 2015)). These items are positioned close to the end of the questionnaire since participants do not always like to answer these questions as they might be viewed as sensitive or complex to answer (Porst, 2014). The questionnaire ends with a final page that expresses

the researcher's gratitude and gives participants the opportunity to enter their email address to receive the research results after the analysis and publication, as recommended by Podsakoff et al. (2012).

5.2.2.5 Pilot testing of the questionnaire

Since one part of the questionnaire was self-developed and other parts were taken from existing research, a pilot testing was implemented, which will now be discussed (Stapleton, 2010). A pilot test is comparable to a “small-scale study to test the questionnaire” (Saunders et al., 2016, p. 723). Within a pilot test it is not the overall aim to generate data, but to evaluate whether the respondents understand and interpret the questions appropriately (David and Sutton, 2011; Kumar, 2014). Problems or misunderstandings will be eliminated afterwards, leading to a higher likelihood that future respondents will not have any problems filling in the questionnaire (Saunders et al., 2016).

For this study, the questionnaire was sent out by email to professors as well as practitioners. Two experienced professors in HRM research were involved to review research aspects of the questionnaire. In addition, three leaders from German SMEs were included in the pilot group, as they could be part of the sample to be studied. As a result, comprehension problems should be eliminated. In addition, the questionnaire was sent to a prospective German teacher, so that spelling and grammar were also checked. They received the questionnaire in the pilot test version, offered by SoSci Survey (Leiner, 2019) so they could immediately comment on aspects which were not clear. Moreover, participants were asked to fill in the questionnaire and to criticize improvable aspects.

After the results of the pilot test returned, the questionnaire was slightly adjusted by the researcher. Hence, some statements have been worded more comprehensibly or minor errors regarding spelling and grammar have been removed. Consequently, the result is the final questionnaire.

5.2.3 Data generation and descriptive sample statistics

At this stage, the cluster as well as snowball sampling are applied in order to generate data (Miles et al., 2014; Teddlie and Tashakkori, 2009), comparable to the EFA (cf. chapter 5.1.5). This leads to a random as well as a probability sample, and not a purposive sample like in qualitative research (Saunders et al., 2016). Moreover, it is possible to reach out to groups as well as individuals via snowball sampling (Saunders et al., 2016). Therefore, the questionnaire was sent out between January 21, 2022 and April 05, 2022 to a variety of potential participants via email and it was posted in social networks like LinkedIn, Facebook

and XING. In addition, disseminators were contacted who forwarded/shared the link to the questionnaire with their network(s)/on their social media profile(s). Prior to sending them an email, they were called and asked if they are willing to support this research. In addition, personalized email addresses that were publicly accessible were gathered and considered as potential participants. Consequently, they received the questionnaire via email. In addition, each person who has received the questionnaire can also forward it to others (snowball sampling).

Finally, 703 people were reached personally, i.e., disseminators, personal contacts, publicly available personal email addresses, and a minimum of 989,828 people had the chance to participate in the questionnaire via (social) networks (i.e., LinkedIn, Facebook, XING), groups (especially on social media) or disseminators in business networks, as indicated by Smith et al. (2018). As respondents might have forwarded the questionnaire (snowball sampling), it is impossible to sum up how many people finally had the chance to participate in the questionnaire. This leads to a situation in which a response rate is not calculable, due to no divisor, and therefore not reportable, like in the case of Smith et al. (2018). A minimum of 990,531 people finally received the questionnaire, leading to 2,948 people opening it using the link. Moreover, 516 people started to fill in the questionnaire and 281 people completed it.

A data clearing process was implemented in order to only include questionnaires which were fully completed, including the consent to participate from those taking part. Therefore, (company) leaders of/in German SMEs represent the intended sample. Within the questionnaire, a question regarding the position of the participant in the company was included in order to ensure that only (company) leaders are part of the intended sample and employees were excluded. Theoretically, there is a risk that employees will impersonate leaders or managing directors. However, since the data is generated and processed in anonymous form (which the participants are aware of), a deliberate false answer is not to be expected. In the cover letter of the questionnaire, participants are already informed that the survey is explicitly aimed at leaders. In addition, each questionnaire which was not from an SME was excluded as well. Speed runners (deg-time exceeding 75) were also excluded in order to filter rigorously (Leiner, 2019). At the end of this data clearing procedure (summarized in table 5.10), 173 questionnaires represent the remaining and usable sample for the CFA and PLS-SEM.

Table 5.10: Clearing of data set for CFA & SEM

Own table

| Clearing level | Data sets |
|--|-----------------------|
| Participants starting to fulfill the questionnaire | 516 |
| Fully completed questionnaires | 281 |
| No consent to participation | -1 |
| Filter question on position in the company | - 38 |
| Filter question on SMEs | - 67 |
| Speed runner | - 2 |
| Companies involved more than once | - 0 |
| Remaining observations for CFA and SEM | <i>N</i> = 173 |

Finally, 173 SME company leaders or leaders within SMEs (average tenure of 10.24 years) completed questionnaires fully, which fit into the sample based on the aforementioned criteria. Thus, more questionnaires were generated than the average of other HRM research using PLS-SEM (which is intended in this study as well), as it is 142.5 questionnaires (Ringle et al., 2020). As a consequence, this sample is considered as acceptable for the intended data analysis and will now be described.

Descriptive statistics follow the logic of the SME criteria. In this sample, there are more SMEs than small companies and more small than micro companies, which is contradictory to the distribution in Germany (2.6% medium, 14.9% small and 81.9% micro companies) (Statistisches Bundesamt, 2022; 2022). On average, 54.22 employees are employed within a company of the sample and an average turnover of 47,404,306.67 Euros is generated. Table 5.11 summarizes the descriptive SME statistics while figure 5.12 provides information on the age structure of the companies.

Table 5.11: Descriptive SME statistics

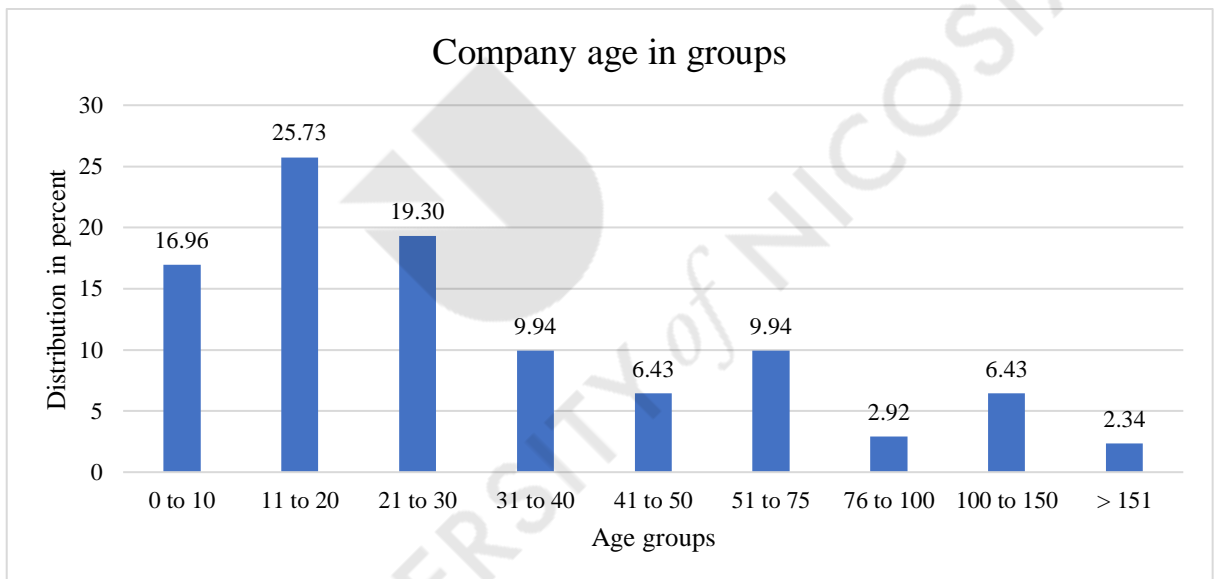
Own table

| Enterprise cate- gory | Total amount | Total (in percent) | Average employees | Average turno- ver (in Euros) |
|--------------------------|--------------|-----------------------|----------------------|----------------------------------|
| Medium | 67 | 38.73 | 114.36 | 132,021,153.80 |
| Small | 58 | 33.53 | 24.81 | 3,902,777.78 |
| Micro | 48 | 27.75 | 5.82 | 790,818.18 |
| SMEs in total | 173 | 100.01 | 54.22 | 47,404,306.67 |

The average age of the company is 36.37 years ($N = 171$, $Mdn = 22$ years), distributed as follows:

Figure 5.12: Company age in groups

Own depiction



The following table 5.12 provides information on the distribution across industry (descending order according to the sample) in comparison to German companies in 2020. Referring to figure 5.12 and tables 5.11 as well as 5.12, the sample drawn is, as expected, not representative with regard to the criteria shown here.

Table 5.12: Distribution of sample across industries

Own table, data from Germany taken from Statistisches Bundesamt (2021)

| Industry | German industry | | Sample | |
|--|------------------|---------------|------------|---------------|
| | Total | In per-cent | Total | In per-cent |
| Provision of other services | 221,472 | 6.8% | 40 | 23.1% |
| Information and communication | 130,254 | 4.0% | 28 | 16.2% |
| Provision of other economic services | 217,859 | 6.7% | 24 | 13.9% |
| Manufacturing industry | 219,449 | 6.7% | 13 | 7.5% |
| Provision of professional, scientific and technical services | 498,735 | 15.3% | 12 | 6.9% |
| Wholesale and retail trade; repair of motor vehicles and motorcycles | 577,161 | 17.7% | 9 | 5.2% |
| Construction industry | 382,713 | 11.7% | 8 | 4.6% |
| Provision of financial and insurance services | 75,187 | 2.3% | 6 | 3.5% |
| Education and teaching | 74,030 | 2.3% | 6 | 3.5% |
| Health and social services | 248,908 | 7.6% | 5 | 2.9% |
| Energy supply | 69,574 | 2.1% | 4 | 2.3% |
| Public administration, defense; social insurance | n. a. | n. a. | 4 | 2.3% |
| Real estate and housing | 204,214 | 6.3% | 3 | 1.7% |
| Art, entertainment and recreation | 99,707 | 3.1% | 3 | 1.7% |
| Agriculture, forestry and fishing | n. a. | n. a. | 3 | 1.7% |
| Hospitality industry | 234,162 | 7.2% | 2 | 1.2% |
| Water supply; sewage and waste disposal and pollution clean-up | 11,360 | .3% | 2 | 1.2% |
| Transport and storage | 107,814 | 3.3% | 1 | .6% |
| Mining and quarrying | 1,984 | .1% | 0 | .0% |
| Total | 3,264,785 | 100.0% | 173 | 100.0% |

5.2.4 Data analysis: Structural equation modeling

For analyzing the hypothesis, partial least squares structural equation modeling (PLS-SEM) will be used as it is possible to indirectly “measure abstract concepts” (Hair et al., 2022, p.

7) and as it is widely used in business research (Sarstedt, 2019). So, certain indicators (or items) are used to measure an unobservable construct indirectly (Hair et al., 2022). Moreover, there is a “high relevance of the PLS-SEM method for HRM studies” (Ringle et al., 2020, p. 1635).

This chapter is structured as follows: First, PLS-SEM will be compared to CB-SEM (covariance-based structural equation modeling) and the decision for PLS-SEM is justified, second PLS-SEM will theoretically be explained, third PLS-SEM will be applied for analyzing the generated in order to test the hypotheses, and fourth the findings will be described.

5.2.4.1 Choosing PLS-SEM instead of CB-SEM

Covariance-based structural equation modeling is (as PLS-SEM) a method for conducting structural equation modeling but focuses on achieving a high fit between data as well as a model (Hair et al., 2022). Therefore, CB-SEM is mainly used to analyze how well data fits a model according to model fit criteria (Hair et al., 2022). On the other hand, PLS-SEM mainly strives to predict target constructs (Hair et al., 2022). Referring to Hair, Risher et al. (2019), PLS-SEM is used when

- a theoretical framework will be examined from a prediction point of view, especially in order to understand the rising complexity
- a complex structural model has been set up with a lot of relationships, constructs and indicators
- constructs are included that are measured formatively
- a comprehensive theoretical grounding for the data is missing, like when using secondary data
- the sample size is rather small, since PLS-SEM can handle small as well as large sample sizes
- data is not normally distributed
- latent variables are required.

In comparison, CB-SEM is used when theory should be tested, circular relationships are expected, error terms need to be specified more clearly or when a global goodness-of-fit value are needed (Hair, Risher et al., 2019).

The purpose of this study meets the criteria for choosing PLS-SEM for certain reasons. First, it is the aim to predict the strength of relationships between independent and dependent variables, i.e., it is desired to understand how strong WFPs are affected by antecedent latent variables and how strong it affects SME performance indicators. This is of interest as the

integration of the technological requirements of virtual leadership on the nexus between transformational leadership climate and internal numerical flexibility has not been evaluated before. Therefore, it is unclear how strong it will affect relationships, accounting for rather exploratory research. So, it is desired to predict “key target constructs or [...] [to identify] key ‘driver’ constructs” (Hair et al., 2011, p. 144). Second, the model (cf. figure 5.9) can be classified as complex since it contains 12 constructs and 84 indicators, combined in a single model. Third, latent variables are included in this study, as several constructs are not directly measurable.

Therefore, PLS-SEM will be used for analyzing the data. According to Hair et al. (2011), these two procedures (PLS-SEM and CB-SEM) are understood as being complementary – depending on the research questions, aims and objectives – like, in this case, a CFA (which is part of CB-SEM) is conducted first and the results will be used for PLS-SEM.

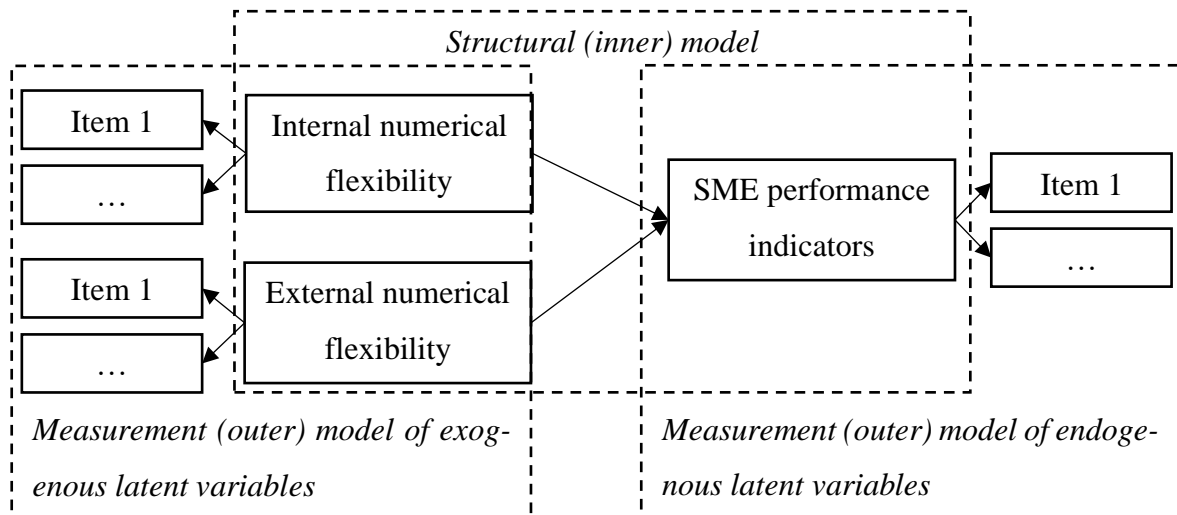
5.2.4.2 Introducing PLS-SEM and testing statistical requirements for conducting PLS-SEM

This chapter provides a brief introduction to PLS-SEM with its assumptions, statistical requirements and an overview of the necessary steps to analyze data with PLS-SEM. The data analysis of the generated data will follow in the chapters below.

By using PLS-SEM, path models can be created which are defined as “a diagram that connects variables/constructs based on theory and logic to visually display the hypotheses that will be tested” (Hair et al., 2017, p. 37). Each path model contains exogenous (independent) and endogenous variables (dependent variables), which represent antecedents as well as consequences within a causal relationship (Weiber and Sarstedt, 2021). Each path is equated with a hypothesis which might also be mediated or moderated by other latent variables (Ringle et al., 2020). Each latent variable consists of one or more item(s) (also called indicator) (Weiber and Sarstedt, 2021), underlining that they are latent instead of being directly observable (Hair et al., 2022). A short example of a path model as an excerpt of the revised conceptual framework is depicted in figure 5.13, serving as an example for further explaining PLS-SEM.

Figure 5.13: Example for a PLS-SEM path model

Own depiction, inspired by Hair et al. (2022)



Referring to Hair et al. (2022), path models contain two models, i.e., the inner (structural) and the outer (measurement) model, while the structural model focuses on the relationships between latent variables and the outer model focuses on the relationships between items and its associated latent variables. Figure 5.13 shows reflective measurement models which are visualized by arrowheads pointing from the latent variable to the indicator, while formative measurement models are visualized vice versa (Hair et al., 2022).

Referring to Hair et al. (2022), several steps must be conducted in order to analyze data which also account for using PLS-SEM in HRM research (Ringle et al., 2020). According to Hair et al. (2022), first the path model has to be specified, i.e., it has to be established based on existing research or theories. In this regard, the structural as well as the measurement have to be specified. Therefore, the relationships including moderation or mediating effects between the latent variables have to be drawn (structural model) and for each latent variable the decision whether it is a reflective or formative measurement has to be taken. The path model for this study has been presented in figure 5.9 and the indicators are presented in the chapter 5.2.2.1, which present reflective measurement models throughout this study.

Afterwards the data has to be generated and examined according to statistical requirements (Hair et al., 2022). These requirements focus on missing data, which should not exceed 15% per observation and five percent per indicator (otherwise the observation/indicator should be deleted) (Hair et al., 2022). Referring to Hair et al. (2022), the researcher has to decide how to handle missing values (e.g., using mean replacement). In this study, the MICE procedure was used to impute missing values (as described earlier), so a data set was established for

PLS-SEM which has no missing indicator values for the latent variables. Suspicious response patterns (e.g., always ticking the highest/lowest possible answer) and outliers have to be evaluated as well. Outliers represent extreme answers to questions (extremely high or low, e.g., by answering 44 on a 7-point Likert scale through accidentally typing 44 instead of four). Therefore, these outliers have to be evaluated and the researcher has to decide if these outliers have to be eliminated or retained. The data has been examined according to suspicious response patterns, which could not be identified. Outliers have been evaluated using IBM SPSS version 28.0.1.0 (142) by creating z-scores (before, reverse coded items have been transformed, so all items are in the same direction). If a z-score is higher than 3.29 (regardless of positive/negative direction), it is understood as an outlier (Field, 2013). This analysis uncovered 37 outliers, representing .239% of the data set. As there is no clear explanation why these outliers occur (as it was not possible to type in answers as numbers manually), they remain in the data set as recommended by Hair et al. (2022).

According to Hair et al. (2022), the data distribution has to be analyzed finally, although PLS-SEM does not require data to be distributed normally. However, a roughly normal distribution is desired. Therefore, skewness should be evaluated which should at least be between -2 and +2 (better -1 and +1). The analysis shows that only one indicator exceeds the skewness threshold slightly (-2.097). Kurtosis should be between -5 and +5 (or better -3 and +3) (Bentler, 2006; Byrne, 2016) while two indicators are exceeding the kurtosis threshold of +3, but remain below +5 (3.573 and 3.959). Therefore, a rough normal distribution within the data set is assumed. Consequently, the data can be used for running PLS-SEM analysis. To sum this up, the descriptive statistics, including skewness and kurtosis but also the mean, median, standard deviation, minimum, maximum as well as valid cases and missing values (in this case there are no missing values as they have been imputed a priori), are depicted in table 5.13. This provides an excerpt of the descriptive statistics, while the complete table is included in the appendix XV.

Table 5.13: Excerpt of descriptive statistics per item

Own table

| | TSVL1 | TSVL2 | TSVL3 | TSVL4 | TSVL8 | TSVL9 | TSVL10 | TSVL11 | INF1 |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| N Valid | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 |
| N Missing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mean | 5.237 | 5.445 | 5.358 | 5.208 | 6.150 | 6.087 | 6.121 | 5.879 | 5.133 |
| Median | 5.000 | 6.000 | 6.000 | 5.000 | 7.000 | 7.000 | 7.000 | 7.000 | 6.000 |
| Std. Deviation | 1.469 | 1.579 | 1.547 | 1.491 | 1.467 | 1.624 | 1.330 | 1.756 | 1.811 |
| Skewness | -0.752 | -1.050 | -0.970 | -0.767 | -2.097 | -1.904 | -1.694 | -1.624 | -0.777 |
| Kurtosis | 0.099 | 0.433 | 0.444 | 0.105 | 3.959 | 2.640 | 2.591 | 1.565 | -0.419 |
| Minimum | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Maximum | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |

Referring to Hair et al. (2022) as well as Barclay et al. (1995), the minimum sample size should be based either on the rule of ten, i.e., sampling should be 10 times larger than the maximal set of arrowheads pointing to a construct (in the structural or measurement model). In this study the minimum sample size would therefore be 100 (ten arrowheads point to both firm-level employee and operational performance). Since the rule of ten is to be regarded as a rule of thumb, the statistical power analysis is applied in order to calculate the minimum sample size in advance by using programs like G*Power (Faul et al., 2009). This includes the desired effect size (based on Cohen (1988)) defining effects as small, medium or large effects (.02, .15, .35), the alpha error probability (.05 as recommended by Döring and Bortz (2016)), the number of predictors in a model (in this case 12) as well as the statistical power level, which is typically at 80% (Hair et al., 2022).

For this study, the minimum sample size (N) is calculated as $N = 127$, based on an effect size of .15 as smaller effects are expected, statistical significance level of .05, power of .8 and seven predictors in the model (cf. output of G*Power analysis in appendix XVI). Smaller effects are anticipated since the guiding model from Martínez-Sánchez, Pérez-Pérez et al. (2008) also had small effects. This also fulfills the requirement of the rule of ten since the maximum number of arrowheads pointing to a construct is 10. Since this study has a total sample size of $N = 173$, this requirement for conducting PLS-SEM is achieved.

Afterwards, the path model can be estimated by using software to run the PLS-SEM algorithm. In this study, SmartPLS version 3.3.9 (Ringle et al., 2015) will be applied for analyzing the data, i.e., estimating the path model, as it is actually the most extensive software (Henseler, 2017). Subsequently, the measurement models have to be assessed before the structural model will be evaluated (Hair et al., 2022). Finally, moderation or mediation analysis can be conducted (Hair et al., 2022). These steps as well as the analysis will be explained (and conducted) in more detail in the following chapters.

5.2.4.3 Establishing and evaluating higher-order constructs

Before the measurement and the structural model will be evaluated, it is necessary to visualize them in SmartPLS. Afterwards, the first step is to establish higher-order constructs (HOCs) with its lower-order constructs (LOCs) in SmartPLS and to evaluate them (Hair et al., 2022).

Two HOCs are part of this model, i.e., technological requirements of virtual leadership (TRVL) and HR commitment practices. HOCs are typically applied, when a theoretical rationale is available, i.e., a reasoning for structuring the data (Hair et al., 2022; Hair et al., 2018). Moreover, organizing several LOCs as a HOC leads to a reduced number of relationships within the model, increasing parsimony (Hair et al., 2018). In the TRVL, there is an empirical rationale for splitting up the scale into two factors (cf. earlier steps in scale development process, especially EFA and CFA). Following this reasoning, the number of relationships in the model decreases since the HOC TRVL is related to other constructs, but not the two LOCs of TRVL.

For analyzing the HOCs, the repeated indicator approach plus the embedded two stage approach were conducted (Sarstedt et al., 2019; Hair et al., 2018). In this regard, the LOCs were assigned with their (through the EFA and CFA) predefined indicators and the HOC was assigned the indicators of both LOCs, while LOCs should have the same number of indicators (Sarstedt et al., 2019; Hair et al., 2018). This is the case for TRVL, but not for HR commitment practices. In general, the approach to evaluate HOCs with its LOCs is comparable to evaluating other constructs in the model, despite discriminant validity (Sarstedt et al., 2019; Hair et al., 2018).

So, in the first stage, the LOCs and the HOCs were assigned with the relevant indicators and visualized in the model. After running the PLS algorithm, the indicator loadings have been analyzed. All indicator loadings exceed the required minimum threshold of .4 and only one did not fulfill the threshold of .7 (Hair et al., 2022). Since the LOC (Organizational) support to ensure the ability to work flexibly meets the internal consistency reliability and convergent validity (cf. table 5.14), the indicator remains. In the next step, the internal consistency reliability is tested by using Cronbach's alpha and the composite reliability, which is more appropriate for PLS-SEM than Cronbach's alpha (Hair et al., 2022; Sarstedt et al., 2019). In addition, the AVE is used to analyze if there is convergent validity (Hair et al., 2022; Sarstedt et al., 2019)

Table 5.14: Analysis of internal consistency reliability and convergent validity of the LOCs

Own table, thresholds based on Hair et al. (2022)

| Criterion | Cronbach's Alpha | Composite Reliability | AVE |
|--|-------------------------|---|------------|
| | ($> .7$) | ($> .6$ exploratory research; $> .7$ advanced research) | ($> .5$) |
| LOCs | | | |
| Competent usage of virtual media in communication with employees | .841 | .893 | .678 |
| Employees' involvement | .612 | .837 | .720 |
| Employees' support | .800 | .870 | .627 |
| (Organizational) support to ensure the ability to work flexibly | .821 | .882 | .654 |

In the last step, discriminant validity is assessed by evaluating the heterotrait-monotrait ratio (HTMT) which must be $< .9$ (Henseler et al., 2015). There is one exception from the HTMT as “discriminant validity does not need to be established between the HOC and the LOCs” (Hair et al., 2018, p. 55). In this study, the HTMTs for the LOCs of TRVL are all below the threshold of .9, ranging from .073 to .805 for the LOC *(organizational) support to ensure the ability to work flexibly* and from .100 to .804 for the LOC *competent usage of virtual media in communication with employees*, so the LOCs are well established (the HTMT from the LOCs to the HOC exceeds the threshold, which is logical as they belong together per definition (Hair et al., 2018)).

The HTMTs of the LOCs of HR commitment practices construct did not meet the thresholds and discriminant validity between employees' involvement and employees' support could not be established with several constructs, cf. table 5.15.

Table 5.15: HTMT of HR commitment practices' LOCs

Own table

| | Employees' involvement | | | Employees' support | | |
|-------------------------------------|------------------------|----------------|------|--------------------|----------------|------|
| | HTMT | CI 95% | Sig. | HTMT | CI 95% | Sig. |
| Employees' support | .904 | [.767; 1.056] | × | | | |
| Functional flexibility | .955 | [.829; 1.114] | × | .802 | [.666; .919] | ✓ |
| HR commitment practices | 1.167 | [1.070; 1.345] | × | 1.169 | [1.125; 1.237] | × |
| Transformational leadership climate | .921 | [.805; 1.058] | × | .628 | [.484; .748] | ✓ |
| Trust | .907 | [.769; 1.062] | × | .633 | [.490; .758] | ✓ |

Moreover, in order to test statistical significance of the HTMT, the bootstrapping procedure is applied, which delivers a confidence interval (CI) to analyze whether “two constructs are empirically distinct” (Hair et al., 2022, p. 124). As the number one falls in the upper confidence interval (cf. table 5.15), this underlines that the LOCs are not empirically different from other constructs (Hair et al., 2017). Since the requirement of having an equal number of indicators per LOC is not fulfilled and because Martínez-Sánchez, Pérez-Pérez et al. (2008) are only presenting a statistical rather than a well-established theoretical justification, the HOC has been replaced by a “usual” construct (i.e., latent variable without hierarchy), including all six indicators, leading to discriminant validity for HR commitment practices. Thus, HR commitment practices remains in the model, but as a construct instead of a HOC.

Finally, there is one HOC in this model, namely TRVL, which has also been evaluated (second stage of two stage approach). The results are summarized in table 5.16. This indicates that the HOC was very well established. Therefore, it will be used for further PLS-SEM analysis.

Table 5.16: Analysis of HOC technological requirements of virtual leadership

Own table

| Criterion | Result |
|-----------------------|---|
| Item loadings | Range between .872 and .950 |
| Composite reliability | .908 |
| Cronbach's alpha | .807 |
| AVE | .832 |
| HTMT | No HTMT exceeds the threshold, all confidence intervals are not including the number 1 → constructs are empirically different from other constructs |

5.2.4.4 Estimating the model

The next step is to estimate the path model. By doing so, the recommendations from Hair et al. (2022) were followed. Thus, the path weighting scheme, aiming at maximizing the R^2 values of the endogenous constructs, has been chosen. Furthermore, the initial value was set at +1, meaning that the first iteration sets +1 for all outer weights, which are to be replaced by the path coefficients in the following iterations. The algorithm runs as long as stable results (outer weights) are generated. Thus, a stop criterion and a maximum number of iterations have to be defined. In this case, the maximum number of iterations is set as 300 with a stop criterion of .0000001. However, literature shows that the algorithm convergences before reaching these maximum criteria (Hanafi, 2007; Hanafi et al., 2021). The control variables have previously been transformed from absolute numbers, like number of employees (company size), by using the logarithm naturalis, enabling researchers to implement nominal data into SmartPLS.

5.2.4.5 Evaluation of the measurement model

The first step of PLS-SEM analysis is the evaluation of measurement models, which can contain the reflective, the formative or both measurement model types (Hair et al., 2022). As this model only contains reflective measurements, the four steps for analyzing those will be gone through (Hair et al., 2022).

The first step is to evaluate the indicator reliability, so the indicator's loadings are in the limelight (Hair et al., 2022). "High outer loadings on a construct indicate the associated indicators have much in common, which is captured by the construct" (Hair et al., 2022, p. 117). In general, the construct should explain 50% of the variance of an indicator which is

equated to an outer loading of at least .708, while “0.70 is considered close enough to 0.708 to be acceptable” (Hair et al., 2022, p. 117). However, even loadings between .4 and .7 should not strictly be deleted (Hair et al., 2022). This should only occur if internal consistency reliability or convergent validity do not reach the thresholds (cf. steps two and three) (Hair et al., 2022). This is due to the contribution of the indicators to the content's validity while indicators with loadings below .4 should in any case be eliminated (Bagozzi et al., 1991; Hair et al., 2022; Hair et al., 2011).

In this study, two indicators have outer loadings below .4 ($CF1 = .369$, $PF5 = .263$). Thus, these two items were deleted. However, there are several items below the .7 threshold, which will be further analyzed in the next steps, by evaluating internal consistency reliability and convergent validity.

In the second step, the internal consistency reliability is evaluated by analyzing Cronbach's alpha as well as the composite reliability, which is more appropriate for PLS-SEM than Cronbach's alpha (Hair et al., 2022; Sarstedt et al., 2019). Both criteria vary between 1 and 0 while higher values account for a higher degree of reliability (Hair et al., 2022). So, values above .6 can be considered as acceptable, if research is exploratory (Hair et al., 2022). Otherwise, a minimum value of .7 is desired (Hair et al., 2022).

The results indicated that especially the composite reliability values are all exceeding the threshold of .7 and that most of the Cronbach's alpha values are also exceeding the threshold. However, three Cronbach's alpha values are below the threshold. As recommended by Hair et al. (2022), the composite reliability is more important for evaluating internal consistency reliability in PLS-SEM, the internal consistency reliability is understood as being established. The results of the measurement model analysis are summarized in appendix XVII.I.

The third step analyzes the convergent validity, i.e., “the extent to which a measure correlates positively with alternative measures of the same construct” (Hair et al., 2022, p. 120). This is done by using the constructs' average variance extracted (AVE), which should be $> .5$ (Hair et al., 2022; Henseler et al., 2016; Sarstedt et al., 2019). The results for this study presented AVEs $< .5$ for cost flexibility (.456), external numerical flexibility (.466), firm-level employee performance (.442), functional flexibility (.479), operational performance (.425) and procedural flexibility (.398). Thus, the indicators of every construct were revisited. The indicators with the lowest outer loadings have one after another been deleted, until the AVE exceeded the threshold. Therefore, the following indicators were eliminated: Cost flexibility ($CF2 = .446$), external numerical flexibility ($ENF2 = .590$), firm-level employee

performance (FLEP3 = .520, FLEP1 = .617, FLEP5 = .649), functional flexibility (FF3 = .484), operational performance (OP6 = .549, OP03 = .562, OP08 = .578, OP7 = .656), and procedural flexibility (PF1 = .274). After that, convergent validity was achieved for all constructs (cf. appendix XVII.I for the final AVEs).

The last step is to analyze for discriminant validity which “is the extent to which a construct is truly distinct from other constructs by empirical standards” (Hair et al., 2022, p. 120). In order to do so, the heterotrait-monotrait ratio (HTMT) has to be evaluated in two ways (Hair et al., 2022; Henseler et al., 2015). Firstly, the absolute value of the HTMT should be below .9 (Henseler et al., 2015). Secondly, the upper bound of the 90% confidence interval of the HTMT should not exceed number one, otherwise it does not account for a statistically significant discriminant validity (Hair et al., 2017). Moreover, this method is understood as “preferred [...] for testing discriminant validity with multiple item measures” (Voorhees et al., 2016, p. 132). According to Hair et al. (2022), bootstrapping has to be performed for generating the confidence intervals. Out of the original sample, subsamples are derived in this procedure, while the number of observations per sample is always equal to the original sample. Thus, bootstrap samples are used to estimate the path model several times. In this case, 5,000 bootstrap samples have been generated by using the complete bias-corrected and accelerated (BCa) bootstrapping with a significance level of .1 and no sign change option, as recommended by Hair et al. (2022).

In this study, the HTMT values are all below the threshold of .9, ranging from .021 to .887. However, the 90% bias corrected confidence intervals for the HTMT between external numerical flexibility and trust (1.083) exceeded the threshold. Moreover, the threshold was exceeded with employee turnover (1.017) (control variable). This underlines that the constructs are not statistically significantly distinct from each other. The indicator did not have a low factor or high cross loadings, it is theoretically not logical to combine those indicators of the constructs as a higher-order construct and there is not more data available to be implemented. Thus, external numerical flexibility was discarded from the model, as it caused the result. In the end, the construct was reflected by only two indicators and had a Cronbach’s alpha of .291. Although the internal consistency reliability is mainly described by the composite reliability, “a good compromise between these two measures” (Hair et al., 2022, p. 120) should be established, which was not the case. Therefore, external numerical flexibility caused nonsignificant results for the bias corrected HTMT confidence interval.

After discarding the construct from the model, all HTMT were still $< .9$ and all bias corrected confidence intervals led to statistically significant results (cf. appendix XVII.II). So, the

model contains reliable and valid measurement instruments (constructs). In the following, the structural model will be evaluated.

In addition to the PLS-SEM analysis, a correlation analysis (using IBM SPSS version 28.0.0.0 (190)) was performed to uncover potential correlations between the constructs (cf. table 5.17). The table shows that several constructs correlate statistically significant with each other. This is especially of interest for the newly developed construct technological requirements of virtual leadership, as no data is available on how the construct relates to others. The correlation matrix shows that TRVL correlates positively and statically significant with internal numerical flexibility ($r = .672^{***}$), functional flexibility ($r = .526^{***}$), HR commitment practices ($r = .504^{***}$), firm-level employee performance ($r = .415^{**}$), cost flexibility ($r = .232^{**}$) and operational performance ($r = .183^{**}$). Moreover, it correlates statistically significant and negatively with several control variables like employee turnover ($r = -.211^{**}$) and company age ($r = -.326^{***}$). As this table is rather complex and contains several statistically significant relationships, it calls for an analysis which combines the constructs in a more structured way, like PLS-SEM, which will now follow.

Table 5.17: Correlations of constructs (Pearson correlation, two-tailed)Own table ($N = 173$, *** $p < .001$; ** $p < .05$; * $p < .1$)

| Construct | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|--|----------|----------|---------|---------|----------|---------|----------|---------|----------|---------|---------|---------|-------|---------|---------|----|
| 1 Company age | 1 | | | | | | | | | | | | | | | |
| 2 Company size | .381*** | 1 | | | | | | | | | | | | | | |
| 3 Cost flexibility | -.182** | -.051 | 1 | | | | | | | | | | | | | |
| 4 Employee absenteeism | .191** | .272*** | -.128* | 1 | | | | | | | | | | | | |
| 5 Employee turnover | .058 | .344*** | -.033 | .347*** | 1 | | | | | | | | | | | |
| 6 Financial performance | -.067 | .020 | .037 | .011 | -.131* | 1 | | | | | | | | | | |
| 7 Firm-level employee performance | -.315*** | -.242** | .175** | -.239** | -.237** | .168** | 1 | | | | | | | | | |
| 8 Functional flexibility | -.324*** | -.243** | .262*** | -.177** | -.252*** | .126* | .506*** | 1 | | | | | | | | |
| 9 HR commitment practices | -.302*** | -.294*** | .293*** | -.181** | -.280*** | .261** | .535*** | .711*** | 1 | | | | | | | |
| 10 Industry type | .268*** | .234** | -.119 | .085 | .100 | -.070 | -.265*** | -.256** | -.288*** | 1 | | | | | | |
| 11 Internal numerical flexibility | -.328*** | -.215** | .358*** | -.162** | -.163** | -.050 | .314*** | .440*** | .475*** | -.254** | 1 | | | | | |
| 12 Operational performance | -.171** | -.196** | .098 | -.153** | -.331*** | .378*** | .633*** | .370*** | .447*** | -.099 | .102 | 1 | | | | |
| 13 Procedural flexibility | -.169** | -.166** | .121 | -.151** | -.064 | .065 | .116 | .072 | .097 | .000 | .087 | .158** | 1 | | | |
| 14 TRVL (HOC) | -.326*** | -.172** | .232** | -.092 | -.211** | .015 | .415*** | .526*** | .504*** | -.233** | .672*** | .183** | .037 | 1 | | |
| 15 Transformational leadership climate | -.348*** | -.396*** | .187** | -.262** | -.360*** | .122 | .592*** | .645*** | .673*** | -.251** | .429*** | .451*** | .140* | .532*** | 1 | |
| 16 Trust | -.188** | -.298*** | .177** | -.259** | -.463*** | .209** | .467*** | .565*** | .678*** | -.179** | .365*** | .440*** | .112 | .351*** | .721*** | 1 |

5.2.4.6 Evaluation of the structural model

When analyzing the structural model, Hair et al. (2022) propose a four-stage procedure; firstly, collinearity issues, secondly, the significance and relevance of relationships, thirdly, the explanatory and fourthly, the predictive power of the model are assessed.

5.2.4.6.1 Collinearity issues

To evaluate the model for collinearity, the variance inflation factor (VIF) is used (Hair et al., 2022). Collinearity means “a strong correlation between two or more predictors” (Field, 2018, p. 401). The VIF should be below 5 or 3 (a more rigorous threshold) for a set of predictors on a construct. In this study, the VIFs varied from 1.000 to 2.837, compare for appendix XVII.III. Thus, the required and more rigorous threshold of 3 was undercut. Therefore, there were no problems with collinearity.

5.2.4.6.2 Significance and relevance of relationships

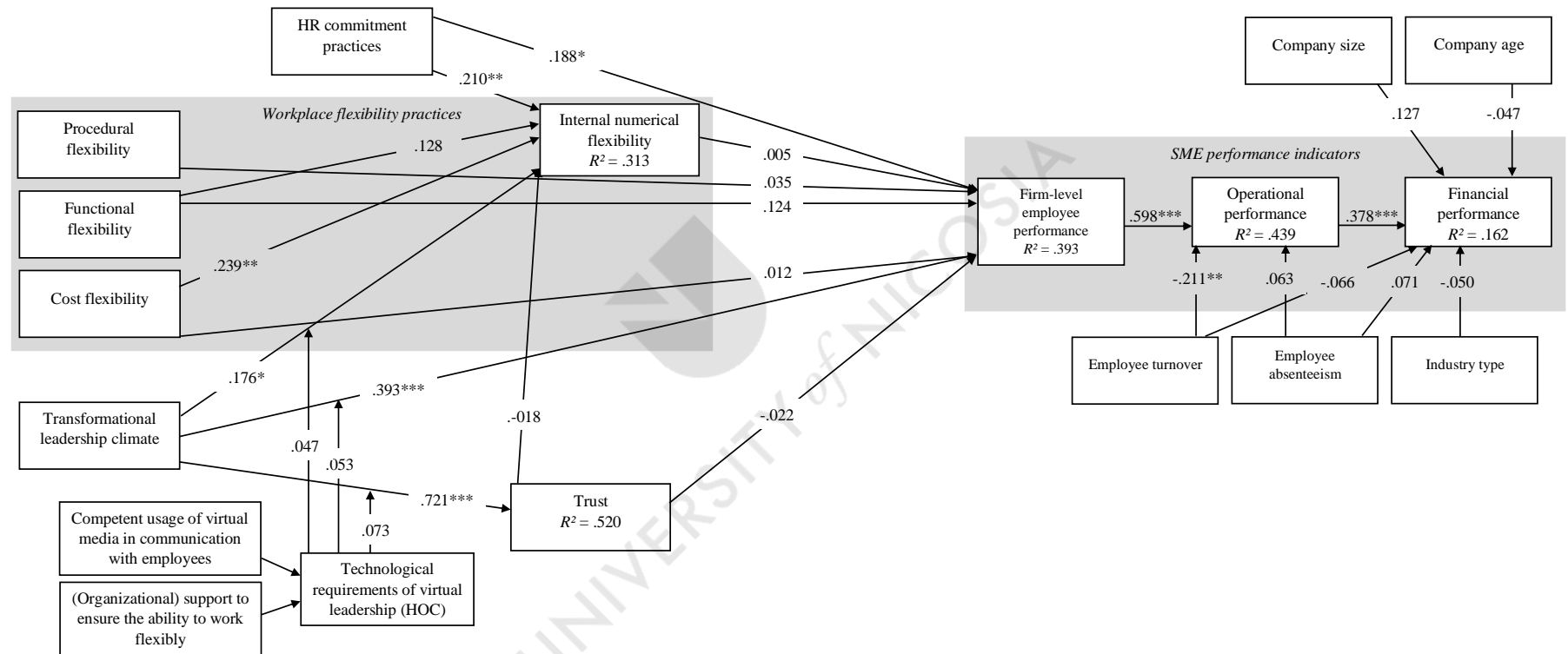
According to Hair et al. (2022), the significance and relevance of relationships are assessed in the second step. Therefore, the path coefficients which have been generated through the PLS-SEM algorithm have to be checked. These standardized values vary from -1 to +1, with results close to 0 representing weak and values close to 1 representing strong relationships. This reflects the relevance of a relationship. Thus, “the individual path coefficients of the path model can be interpreted just as the standardized beta coefficients in an ordinary least squares regression” (Hair et al., 2022, p. 193). Based on the bootstrapping procedure, standard errors are calculated, which makes it possible to assess statistical significance based on the p value, that most of the researchers use for the evaluation of statistical significance (Hair et al., 2022).

For this study, every hypothesis was evaluated according to its p value. $p > .1$ was classified as not significant (n. sig.) while $p < .1$ was classified as being significant, as is usually the case in rather exploratory studies (Hair et al., 2022). Appendix XVII.IV presents the path coefficients with its associated p values as well as the bias corrected confidence interval.¹⁵ Figure 5.14 visualizes the results of this initial model (path coefficients β , p values, R^2), including the moderator analysis (following in chapter 5.2.4.7.1).

¹⁵ This is an intermediate result. The final results are presented in chapters 5.2.4.8 to 5.3.

Figure 5.14: Structural equation modeling results – Initial model on workplace flexibility practices, transformational leadership climate, technological requirements of virtual leadership, trust and HR commitment practices on SME performance indicators

Own depiction (** $p < .001$; * $p < .05$; * $p < .1$)



Thus, nine relationships (including one control variable) were found to be statistically significant, while 13 (including six control variables) relationships were not statistically significant. In addition, three hypotheses could not be assessed, as external numerical flexibility construct was discarded from the model. A more detailed analyses of the hypotheses follows in chapter 5.2.5.

5.2.4.6.3 Explanatory power of the model

In order to analyze the explanatory power of the model, the R^2 as well as the f^2 values are evaluated in the third step (Hair et al., 2022; Henseler et al., 2016). R^2 is “the proportion of variance in one variable explained by” other variables (Field, 2018, p. 1011). Therefore, the explained variance of a latent variable by several others represents the coefficient of determination (R^2) (Hair et al., 2022). Since the R^2 is calculated based on the generated data which is also used for model estimation, it is a value representing in-sample predictive power (Chin, 2010; Hair et al., 2022; Rigdon, 2012; Sarstedt et al., 2014). There are no thresholds for the R^2 as it is based on the number of predicting constructs (Hair et al., 2022). Thus, the interpretation should also include the *adjusted* R^2 , considering sample size as well as complexity of the model (Henseler et al., 2016). In addition, the f^2 value is used to quantify the impact of a certain relationship and therefore it “is somewhat redundant to the path coefficients” (Hair et al., 2022, p. 195). Cohen (1988) presented guidelines for interpreting the effect size as small (.02), medium (.15) or large (.35) effect.

The (*adjusted*) R^2 values for this study have been summarized in table 5.18. So, three R^2 values are moderate ($> .33$) while two are weak (Chin, 1998b; Henseler et al., 2009).

Table 5.18: Analysis of explanatory power

Own table

| Latent variable | R^2 | <i>Adjusted</i> R^2 |
|---------------------------------|-------|-----------------------|
| Financial performance | .162 | .131 |
| Firm-level employee performance | .393 | .368 |
| Internal numerical flexibility | .313 | .292 |
| Operational performance | .439 | .429 |
| Trust | .520 | .517 |

Analyzing the f^2 values led to a situation in which two large effects (firm-level employee on operational performance and transformational leadership climate on trust) and six small effects (operational on financial performance, transformational leadership climate as well as

HR commitment practices on firm-level employee performance, cost flexibility on internal numerical flexibility, HR commitment practices on internal numerical flexibility and employee turnover on operational performance) were identified. The full results are visualized in appendix XVII.IV while the further analysis focuses on the path coefficients due to being redundant to f^2 .

5.2.4.6.4 Predictive power

In order to assess the predictive power, i.e., the out-of-sample predictive power, Hair et al. (2022) recommend to use the $PLS_{predict}$ procedure from Shmueli et al. (2016). Earlier, only the Q^2 statistic (which should be above zero) was used to assess the predictive power but criticism has been raised that predictive power analysis is inaccurate (Sarstedt et al., 2017; Shmueli et al., 2016). For $PLS_{predict}$, the data set is divided into several training samples (estimating the model) and a holdout sample (Danks et al., 2017; Hair et al., 2022). For predicting indicator values of a particular selected dependent construct, $PLS_{predict}$ utilizes indicator values of the independent constructs from observations in holdout sample (Danks et al., 2017). In addition, it applies its model values taken from the training sample to make predictions for the indicators of the dependent constructs in the holdout sample. If the difference between those two is low, a high predictive power is indicated (Hair et al., 2022). Referring to Hair et al. (2022), the root mean square error ($RMSE$) is compared between the PLS path model and the linear regression model (LM). When all $RMSE$ in PLS-SEM are below those in LM, there is a high predictive power. If most of $RMSE$ in PLS-SEM are below those in LM, there is a medium predictive power. When all $RMSE$ in PLS-SEM are above those in LM, the model is lacking predictive power and when they are not greater than in LM, there is low predictive power.

In order to run $PLS_{predict}$, ten folds have been chosen, meaning that the sample was divided into $k = 10$ subsamples (folds) of which each included one handout and nine training samples, as recommended by Hair et al. (2022). This procedure has been repeated automatically ten times. (Hair et al., 2022). In this study, the $Q^2_{predict}$ values of two indicators are below zero (FP2 and FP3), underlining that they do not meet the threshold. As the $Q^2_{predict}$ values do ignore relevant information, which is provided by the PLS path model, the $RMSE$ values of the PLS and LM have been compared for assessing the predictive power instead of “mechanically removing corresponding indicators” (Hair et al., 2022, p. 205). In this analysis, two target constructs have been analyzed: firm-level employee performance as well as internal numerical flexibility, cf. table 5.19 summarizing the findings. Since $RMSE$ values have to be compared, the results are twofold. On the one hand, the $RMSE$ values of firm-level

employee performance are mainly smaller in PLS than in LM, underlining a medium predictive power. On the other hand, the *RMSE* values of internal numerical flexibility are all smaller in PLS than in LM, indicating a high predictive power. Thus, the model had at least a medium, or even a high predictive power.

Table 5.19: Predictive power analysis

Own table

| Indicator | PLS | | LM | | RMSE in PLS-SEM < LM |
|-----------|-------------|--|-------------|--|----------------------|
| | <i>RMSE</i> | <i>Q²_{predict}</i> | <i>RMSE</i> | <i>Q²_{predict}</i> | |
| FLEP10 | .929 | .084 | 1.037 | -.142 | ✓ |
| FLEP4 | .944 | .336 | .920 | .368 | × |
| FLEP8 | 1.018 | .108 | 1.087 | -.018 | ✓ |
| FLEP6 | 1.216 | .105 | 1.315 | -.047 | ✓ |
| FLEP9 | 1.081 | .150 | 1.171 | .003 | ✓ |
| FLEP2 | 1.003 | .178 | 1.082 | .042 | ✓ |
| FLEP7 | .985 | .168 | 1.047 | .059 | ✓ |
| INF1 | 1.672 | .154 | 1.698 | .126 | ✓ |
| INF2 | 1.841 | .241 | 1.900 | .192 | ✓ |
| INF4 | 2.144 | .047 | 2.283 | -.081 | ✓ |
| INF3 | 1.751 | .138 | 1.902 | -.017 | ✓ |
| INF5 | 1.769 | .236 | 1.930 | .091 | ✓ |

5.2.4.7 Advanced PLS-SEM analysis

In addition to “usual” PLS-SEM analysis, advanced analysis will be conducted in the following two chapters, namely moderation and mediation analysis.

5.2.4.7.1 Moderation analysis

Moderator variables are constructs which influence the relationship between two other constructs according to their strength or direction (Hair et al., 2022). As the effects without the moderator in comparison to those with a moderator differ, moderation analysis is a complementary analysis which is not immediately included in the first analyses of the measurement and structural model (Hair et al., 2022). However, moderating effects are typically defined a priori and visualized as an arrowhead pointing at a relationship (Hair et al., 2022). For including a moderator into a PLS-SEM analysis, the moderator must have a direct effect on the endogenous construct, controlling the moderator’s direct impact (Hair et al., 2022). In

order to operationalize a moderation analysis, Chin et al.'s (2003) two-stage approach is recommended as it is advantageous when comparing statistical power, prediction and estimation accuracy to other approaches (Becker, J. et al., 2018; Henseler and Chin, 2010).

The first moderating effect which will be analyzed is corresponding to hypothesis H₁₇ (TRVL moderates the relationship between transformational leadership climate on internal numerical flexibility positively) by applying Chin et al.'s (2003) recommended two-stage approach. Thus, TRVL (HOC) was implemented in the estimated model and directly linked to the endogenous construct. Moreover, the PLS algorithm was calculated, leading to reliable and valid results for the moderator's variable, as required (Hair et al., 2022). Furthermore, the evaluation of the structural model led to usable results. However, it is notable that by adding TRVL (HOC), the relationship of transformational leadership climate and internal numerical flexibility became negative and insignificant, cf. table 5.20. In the first analysis without TRVL (HOC) the relationship was positive and significant ($\beta = .176, p = .099$).

Table 5.20: Results of moderation analysis: TRVL (HOC) moderating transformational leadership climate and internal numerical flexibility

Own table

| Path | Path coefficient | f^2 | p value |
|---|------------------|-------|-----------|
| Stage 1 | | | |
| Transformational leadership climate → internal numerical flexibility | -.043 | .001 | .632 |
| TRVL (HOC) → internal numerical flexibility | .574 | .443 | .000 |
| Stage 2 | | | |
| Moderation of TRVL (HOC) on relationship between transformational leadership climate → internal numerical flexibility | .047 | .005 | .363 |

After completing stage 1, the interaction term was created in SmartPLS. The results of the moderating effect show that the relationship between transformational leadership climate and internal numerical flexibility is not moderated by TRVL (HOC) as the bootstrapping led to a non-significant outcome ($\beta = .047, p = .363$). Thus, H₁₈ is not supported.

The next hypothesis is H₁₉, postulating that the relationship between transformational leadership climate and firm-level employee performance is moderated by TRVL (HOC). The

two-stage approach led to a situation where the measurement as well as structural model evaluation were successful. Moreover, the effect of transformational leadership climate on firm-level employee performance is still positive and significant ($\beta = .357, p = .001$). The path between TRVL (HOC) and firm-level employee performance is also positive but not significant ($\beta = .121, p = .169$). Finally, no moderation effect was identified as the moderator is very small and not significant ($\beta = .053, p = .411$). Therefore, H₁₉ is not supported. The detailed results are summarized in the appendix XVII.V.

The last hypothesis focuses on the moderating effect of TRVL (HOC) on the relationship between transformational leadership climate and trust (H₂₀). Again, measurement as well as structural model were well established. The effect of transformational leadership climate on trust is still positive and significant ($\beta = .734, p = .000$) while the effect of TRVL (HOC) on trust negative, weak and not significant ($\beta = -.024, p = .760$). The moderation of TRVL (HOC) on the nexus between transformational leadership climate and trust is very small, positive but not significant ($\beta = .073, p = .194$). Thus, H₂₀ is not supported. The detailed results are summarized in the appendix XVII.VI.

H₁₆ (Transformational leadership climate moderates the nexus between external numerical flexibility and firm-level employee performance positively) could not be evaluated as the external numerical flexibility construct was eliminated from the model due to lacking discriminant validity.

5.2.4.7.2 Mediation analysis

“Mediation occurs when a third mediator construct intervenes between two other related constructs” (Hair et al., 2022, p. 229). For analyzing potential mediations, Baron and Kenny’s (1986) procedure was used in recent years, although there are methodological and conceptual problems present (Hayes, 2018). Thus, the characterization of mediations follows Zhao et al.’s (2010) guidelines. According to Zhao et al. (2010), the following potential outcomes exist: No, full or partial mediation. These can be complementary ((in)direct effects have the same direction by being significant) or competitive ((in)direct effects have different directions by being significant). If the indirect path is not significant, but the direct path is significant, there is a direct-only, i.e., no mediation. If the indirect as well as direct paths are not significant, there is no effect and thus no mediation. If the indirect path is significant, but the direct path is not significant, there is an indirect-only, i.e., a full mediation. If the direct as well as indirect paths are significant and if the product of all three paths is negative, there is a partial competitive mediation. If the product of the three paths is positive, there is a complementary partial mediation.

For analyzing mediations in PLS-SEM, measurement and structural model evaluations have to be conducted after implementing the mediating construct (Hair et al., 2022). In order to test the significance of a mediation, bootstrapping should again be performed (not the Sobel (1982) test) as this does not require distributional assumptions and works well with small sample sizes (Hair et al., 2022).

As proposed earlier, trust will be evaluated for being a potential mediator on the relationship between transformational leadership climate and firm-level employee performance (H_{17}). Therefore, the bootstrapping procedure was conducted. The results present a significant direct effect ($\beta = .393, p = .000$), while the indirect effect was negative and insignificant ($\beta = -.016, p = .827$), cf. table 5.21. Thus, no mediation was established, but a direct-only nexus exists between transformational leadership climate and firm-level employee performance.

Table 5.21: Mediation analysis: Transformational leadership climate → trust → firm-level employee performance

Own table

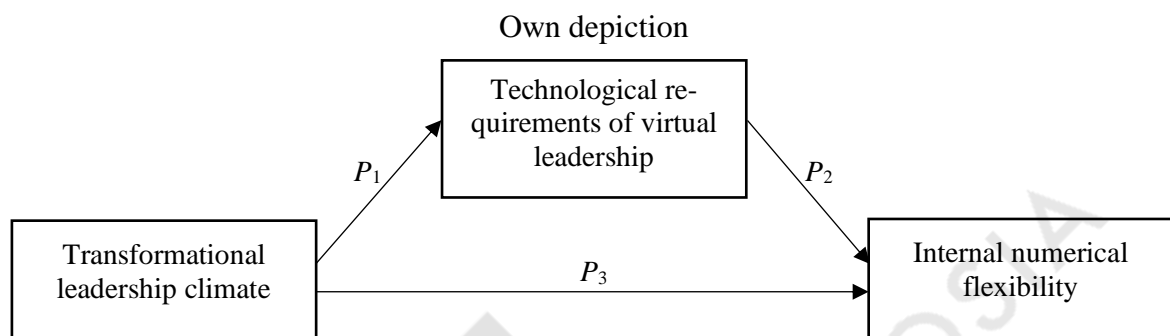
| Path | Direct effect | 90% confidence interval | Significance ($p < .1$) | Indirect effect (via trust) | 90% confidence interval | Significance ($p < .1$) |
|---|---------------|-------------------------|---------------------------|-----------------------------|-------------------------|---------------------------|
| Transformational leadership climate → firm-level employee performance | .393 | [.240, .550] | Yes (.000) | -.016 | [-.133, .101] | No (.827) |

As this quantitative study has also an exploratory character, a mediation analysis is conducted for analyzing whether the relationship between transformational leadership climate and internal numerical flexibility is mediated by TRVL (HOC). This additional and not a priori established hypothesis is inspired by a non-significant moderation analysis in which the direction of the path coefficient changed after implementing TRVL (HOC). Thus, a mediation analysis is considered since “theoretical considerations enable [...] to adjust and further examine [...] previous considerations” (Hair et al., 2022, p. 231). From a theoretical perspective, TRVL (HOC) being a potential mediator is reasonable because leaders need to use technological tools appropriately when leading flexibly working employees. In contrast

to the primary understanding of strengthening this relationship (no moderating effect), it is probably a necessary construct explaining that nexus. Thus, when leading flexibly working employees, leaders need to use technological tools appropriately, for reaching employees both technically and emotionally. Therefore, a mediation is anticipated as depicted in figure 5.15 and written up in the following hypothesis:

H₂₃: Technological requirements of virtual leadership mediates the nexus between transformational leadership climate and internal numerical flexibility positively.

Figure 5.15: Visualization of a mediation



All measurement and structural model assessments were successful, so a mediation analysis was performed by implementing TRVL (HOC) as the mediating construct on the aforementioned nexus. The direct relationship between those two constructs changed and became insignificant after implementing the mediator (cf. table 5.22). However, the indirect effect, i.e., the mediating effect, is positive and significant ($\beta = .304$, $p = .000$). Moreover, the level of significance increased extensively from $p = .097$ to $p = .000$.

Table 5.22: Mediation analysis: Transformational leadership climate → technological requirements of virtual leadership → internal numerical flexibility

Own table

| Path | Direct effect | 90% confidence interval | Significance ($p < .1$) | Indirect effect (via TRVL (HOC)) | 90% confidence interval | Significance ($p < .1$) |
|--|---------------|-------------------------|---------------------------|----------------------------------|-------------------------|---------------------------|
| Transformational leadership climate → internal numerical flexibility | -.043 | [-.190, .104] | No (.637) | .304 | [.231, .394] | Yes (.000) |

Following the proposed mediation analysis procedure (Hair et al., 2022), the indirect effect is significant while the direct effect is not significant, a full mediation was established. Thus, the “estimated cause-effect relationship [...] [is not] the ‘true’ effect because a systematic influence – a certain phenomenon (i.e., a mediator) – has not been accounted for in the theoretical model” (Hair et al., 2022, p. 232). Moreover, H₂₃ was, therefore, supported and technological requirements of virtual leadership was included as a mediating construct.

5.2.4.8 Final model: Model on workplace flexibility practices, transformational leadership climate, technological requirements of virtual leadership, trust and HR commitment practices on SME performance indicators

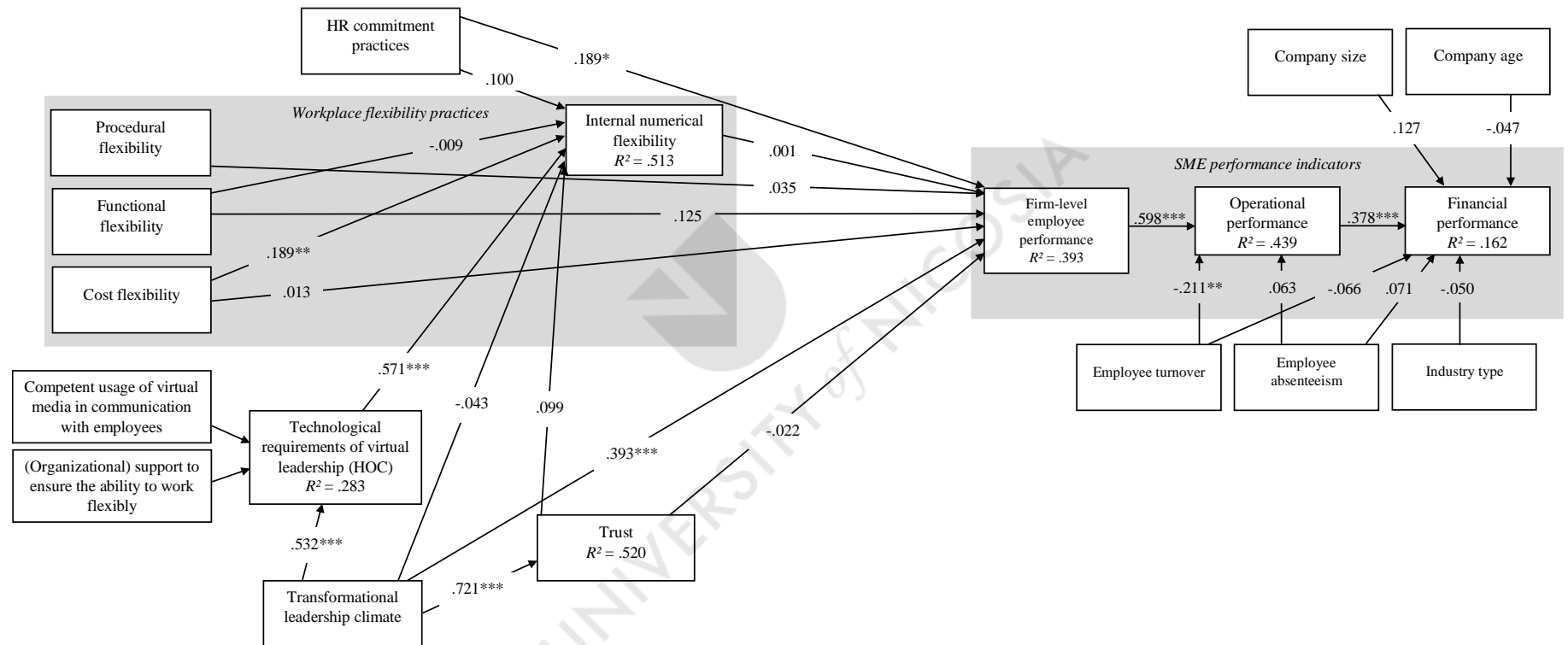
Due to the adjustment made (TRVL (HOC) implemented as a mediator instead of a moderator), a new – and final – model was established. Figure 5.16 visualizes the final model, including its path coefficients, level of significance and the R^2 value in the boxes below the construct’s name.

Nevertheless, the a priori developed model has been analyzed in order to transparently present the research process in total (cf. chapters 1.2.5.5 until 1.2.5.7.2). Otherwise, questionable research procedures (QRPs) would have been conducted (Brachem et al., 2022). In those cases, researchers only present significant relationships after analyzing data multiple times in search for significance (Head et al., 2015). This method is called *p*-hacking (based on the *p* value) (Head et al., 2015). Moreover, HARKing occurs, when “the researcher develops and reports post hoc hypotheses that suggest that findings were defined a priori rather than identified post hoc” (Banks et al., 2016, p. 8). Thus, these QRPs are understood as a “scientific fraud” (Fiedler and Schwarz, 2016, p. 6).

In order to be scientifically accurate and transparent, neither the *p* values were adjusted (*p*-hacking) nor the hypotheses were changed afterwards in such a way that only significant correlations emerged (HARKing). On the contrary, the model and hypothesis development process were openly explained from the beginning (see previous chapters). In addition, it was made transparent why and how the explorative research was conducted and what results (again based on the original hypotheses plus the explorative research) were generated.

Figure 5.16: Structural equation modeling results – Model on workplace flexibility practices, transformational leadership climate, technological requirements of virtual leadership, trust and HR commitment practices on SME performance indicators

Own depiction (** $p < .001$; ** $p < .05$; * $p < .1$)



Nevertheless, all criteria regarding the measurement as well as the structural model have to be reassessed, since a new model was established. The detailed results of the analyses are included in the appendices XVIII.I to XVIII.III, but also summarized very briefly now and in table 5.23. All indicator loadings were above .5 as they are ranged between .520 and 1.000 (mean (M) = .788, median (Mdn) = .782), so indicator reliability was established. Referring to internal consistency reliability, Cronbach's alpha values ranged from .608 to 1.000 (M = .864, Mdn = .864) while composite reliability varied from .764 to 1.000 (M = .912; Mdn = .911). Thus, internal consistency reliability was established. Convergent validity was also established since the AVE varied from .515 to 1.000 (M = .736, Mdn = .650). Moreover, discriminant validity was also established as all HTMT values were below .9 and the upper bound of the confidence interval did not include 1. Therefore, the measurement model was well established.



Table 5.23: Summary of model assessment

Own table

| Construct | No. of indicators | Indicator loadings (min. to max.) | Cronbach's alpha | Composite reliability | AVE | Discriminant validity |
|--|--------------------------|--|-----------------------------|----------------------------------|------------|----------------------------------|
| Company age | 1 | 1.000 | 1.000 | 1.000 | 1.000 | Yes |
| Company size | 1 | 1.000 | 1.000 | 1.000 | 1.000 | Yes |
| Cost flexibility | 3 | .742 – .828 | .682 | .821 | .604 | Yes |
| Employee absenteeism | 1 | 1.000 | 1.000 | 1.000 | 1.000 | Yes |
| Employee turnover | 1 | 1.000 | 1.000 | 1.000 | 1.000 | Yes |
| Financial performance | 5 | .748 – .863 | .878 | .911 | .672 | Yes |
| Firm-level employee performance | 7 | .675 – .823 | .843 | .881 | .515 | Yes |
| Functional flexibility | 4 | .599 – .843 | .716 | .822 | .542 | Yes |
| HR commitment practices | 6 | .645 – .805 | .834 | .877 | .543 | Yes |
| Industry type | 1 | 1.000 | 1.000 | 1.000 | 1.000 | Yes |
| Internal numerical flexibility | 5 | .690 – .872 | .850 | .893 | .627 | Yes |
| Operational performance | 6 | .659 – .764 | .815 | .865 | .518 | Yes |
| Procedural flexibility | 3 | .520 – .929 | .608 | .764 | .532 | Yes |
| Technological requirements of virtual leadership (HOC) | 2 | .906 – .925 | .807 | .912 | .838 | Yes |
| Transformational leadership climate | 4 | .861 – .886 | .898 | .929 | .765 | Yes |
| Trust | 6 | .576 – .888 | .893 | .918 | .621 | Yes |

According to the structural model, no collinearity issues were identified since all VIFs were below 3 (ranging from 1.000 to 2.836, $M = 1.667$, $Mdn = 1.314$). Referring to the significance and relevance of relationships, nine were significant while 15 were insignificant (including five control variables). The evaluation of hypothesis follows in chapter 5.2.5. The explanatory power of the relationships led to f^2 values between .000 and 1.081 ($M = .123$, $Mdn = .008$). Four relationships had a large effect (TRVL (HOC) on internal numerical flexibility ($f^2 = .420$), firm-level employee performance on operational performance ($f^2 = .584$), transformational leadership climate on TRVL (HOC) ($f^2 = .395$) and transformational leadership climate on trust ($f^2 = 1.081$)) while no relationships had medium effects. However, five relationships had small explanatory power (operational performance on financial performance ($f^2 = .148$), HR commitment practices on firm-level employee performance ($f^2 = .021$), transformational leadership climate of firm-level employee performance ($f^2 = .095$), cost flexibility on internal numerical flexibility ($f^2 = .066$), employee turnover on operational performance ($f^2 = .068$)). The (*adjusted*) R^2 values are summarized in table 5.24. Thus, the R^2 of internal numerical flexibility increased from .313 up to .513 and the *adjusted* R^2 was raised from .292 to .495. Hence, a higher degree of variance in that construct has been explained via the final model, leading to a higher explanatory power because of the inclusion of technological requirements of virtual leadership as a possible mediator in the final in comparison to the initial model.

Table 5.24: Explanatory power analysis – R^2 values

Own table

| Latent variable | R^2 | Adjusted R^2 |
|---------------------------------|-------|----------------|
| Financial performance | .162 | .131 |
| Firm-level employee performance | .393 | .367 |
| Internal numerical flexibility | .513 | .495 |
| Operational performance | .439 | .429 |
| TRVL (HOC) | .283 | .279 |
| Trust | .520 | .517 |

Referring to predictive power, the analysis of $RMSE$ values showed a twofold outcome (cf. appendix XVIII.IV). The $RMSE$ values of firm-level employee performance indicated a medium predictive power since nearly all (except from one) indicators reached smaller $RMSE$ values in PLS in comparison to LM. The results of analyzing $RMSE$ values for internal numerical flexibility accounted for high predictive power since all $RMSE$ values in PLS are

smaller than in LM. Therefore, the model had at least a medium, or even a high predictive power.

5.2.4.9 Controlling common method bias: Harman's single factor test

As this study is based on self-reported data, the common method bias needs to be assessed, although respondents were informed that their data will be handled anonymously and confidentially (preventing biased answers) (Chatterjee, Chaudhuri, Thrassou and Vrontis, 2022). For analyzing whether common method bias is inherent in the data, Harman's single factor test was performed by using SPSS (Chatterjee, Chaudhuri, Thrassou and Vrontis, 2022; Podsakoff et al., 2003). This test is often performed, although it includes limitations, like not explicitly statistically controlling for common method bias or the chance to be less conservative if the number of indicators increases as this simultaneously increases the likelihood to have more than one factor (Podsakoff et al., 2003).

Therefore, the test is understood as an approximation rather than an absolutely binding statement. Nevertheless, it has been conducted and led to 23.70% explained variance in a single factor, which is below the cut-off value of 50% (Chatterjee, Chaudhuri, Thrassou and Vrontis, 2022; Podsakoff et al., 2003). This indicates that there is no common method bias and that further results will not be distorted.

5.2.5 Evaluation of hypotheses

The results of the evaluation of hypotheses are summarized in table 5.25 and each hypothesis will now be evaluated (the discussion of results, especially in comparison to literature and the qualitative study, follows in the last chapter of this thesis, chapter 6.1).

H₁ predicts that HR commitment practices are positively related to firm-level employee performance. The results uncover a statistically significant path coefficient ($\beta = .189, p = .058$) with a f^2 of .021. Therefore, H₁ is supported.

H₂ predicts a positive relationship between HR commitment practices and internal numerical flexibility. The path coefficient is positive ($\beta = .100, p = .287, f^2 = .007$) but not significant. However, a precise conclusion cannot be drawn in this regard due to an insignificant result. Therefore, H₂ is not supported.

H₃ predicts a positive association between procedural flexibility and firm-level employee performance. The path coefficient is positive ($\beta = .035, p = .669, f^2 = .002$) but insignificant. Thus, the direction of the relationship is as anticipated but a clear statement cannot be made due to a non-significant result. Therefore, H₃ is not supported.

H₄ predicts a positive nexus between functional flexibility and internal numerical flexibility. The results indicate a small negative relationship ($\beta = -.009$, $p = .920$, $f^2 = .000$) which is not significant while having a negative direction. But as the path coefficient is very close to zero and the effect size is zero, there literally is no effect. Thus, H₄ is not supported.

H₅ predicts a positive relationship between functional flexibility and firm-level employee performance. The path coefficient is positive and indicates a positive relationship ($\beta = .125$, $p = .125$, $f^2 = .011$). However, this relationship is not statistically significant. Therefore, a precise statement on the influence of functional flexibility on firm-level employee performance cannot be made.

H₆ predicts a positive nexus between cost flexibility and internal numerical flexibility. The path coefficient is positive and significant ($\beta = .189^{**}$, $p = .001$, $f^2 = .066$). Thus, there is a small positive effect, supporting H₆.

H₇ predicts a positive relationship between cost flexibility and firm-level employee performance. The results show a positive and insignificant path coefficient ($\beta = .013$, $p = .852$, $f^2 = .000$). Therefore, H₇ is not supported.

H₈ predicts a positive nexus between internal numerical flexibility and firm-level employee performance. The path coefficient is nearly zero, not significant and the effect size is zero ($\beta = .001$, $p = .987$, $f^2 = .000$). Thus, H₈ is not supported.

H₉, H₁₀ and H₁₆ were not evaluated because external numerical flexibility had to be discarded from the model (due to lacking discriminant validity). Therefore, no further conclusions can be drawn on these hypotheses.

H₁₁ predicts a positive relationship between trust and internal numerical flexibility. The path coefficient is positive, but not significant ($\beta = .099$, $p = .239$, $f^2 = .008$). Therefore, H₁₁ is not supported.

H₁₂ predicts a positive relationship between trust and firm-level employee performance. The results show a negative and statistically insignificant effect ($\beta = -.022$, $p = .824$, $f^2 = .000$). Therefore, H₁₂ is not supported.

H₁₃ predicts a positive relationship between transformational leadership climate and internal numerical flexibility. The path coefficient is negative ($\beta = -.043$, $p = .637$, $f^2 = .001$), small and not significant. Thus, H₁₃ is not supported. However, the mediation analysis absorbs this effect (cf. H₂₃).

H₁₄ predicts a positive relationship between transformational leadership climate and firm-level employee performance. The results present a strong positive and significant relationship ($\beta = .393, p = .000, f^2 = .095$). Therefore, H₁₄ is supported.

H₁₅ predicts a positive relationship between transformational leadership climate and trust. The path coefficient indicates a strong positive and significant relationship ($\beta = .721, p = .000, f^2 = 1.081$). As a consequence, H₁₅ is supported.

H₁₇, H₁₈, H₁₉ and H₂₀ (moderation and mediation analysis) have already been presented in detail in chapters 5.2.4.7.1 and 5.2.4.7.2. Therefore, this will not be repeated at this stage.

H₂₁ predicts a positive relationship between firm-level employee performance and operational performance. The results show a positive and strong path coefficient ($\beta = .598, p = .000, f^2 = .584$) which is also significant. Thus, H₂₁ is supported.

H₂₂ predicts a positive relationship between operational and financial performance. The results indicate a positive, strong and significant path coefficient ($\beta = .378, p = .000, f^2 = .148$). Thus, H₂₂ is supported.

H₂₃ predicts that technological requirements of virtual leadership mediates the nexus between transformational leadership climate and internal numerical flexibility positively. The detailed analysis of this hypothesis has already been done in chapter 5.2.4.7.2. The path coefficient presents a positive mediation ($\beta = .304, p = .000$) which is highly significant. This is also the reason for H₁₃ being not significant. Finally, H₂₃ is supported and technological requirements of virtual leadership serves as a mediator on the nexus between transformational leadership climate and internal numerical flexibility.

Analyzing the control variables predict that employee absenteeism is positively but insignificantly associated with financial ($\beta = .071, p = .360$) and operational performance ($\beta = .063, p = .304$). Employee turnover is statistically significantly and negatively related to operational performance ($\beta = -.211, p = .001$), while insignificantly and negatively related to financial performance ($\beta = -.066, p = .420$). Moreover, the industry type is statistically not significant and negatively correlated to financial performance ($\beta = -.050, p = .486$). The company size is positively – but statistically insignificantly – correlated to financial performance ($\beta = .127, p = .130$), while the age of companies is negatively and statistically insignificant correlated to financial performance ($\beta = -.047, .533$).

Table 5.25: Summary of analyzed hypotheses

Own table

| No. | Hypothesis | Result |
|-----------------|--|---------------|
| H ₁ | HR commitment practices are positively related to firm-level employee performance. | Supported |
| H ₂ | HR commitment practices are positively related to internal numerical flexibility. | Not supported |
| H ₃ | Procedural flexibility is positively related to firm-level employee performance. | Not supported |
| H ₄ | Functional flexibility is positively related to internal numerical flexibility. | Not supported |
| H ₅ | Functional flexibility is positively related to firm-level employee performance. | Not supported |
| H ₆ | Cost flexibility is positively related to internal numerical flexibility. | Supported |
| H ₇ | Cost flexibility is positively related to firm-level employee performance. | Not supported |
| H ₈ | Internal numerical flexibility is positively related to firm-level employee performance. | Not supported |
| H ₉ | External numerical flexibility is negatively related to firm-level employee performance. | Not evaluated |
| H ₁₀ | External numerical flexibility is negatively related to trust. | Not evaluated |
| H ₁₁ | Trust is positively related to internal numerical flexibility. | Not supported |
| H ₁₂ | Trust is positively related to firm-level employee performance. | Not supported |
| H ₁₃ | Transformational leadership climate is positively related to internal numerical flexibility. | Not supported |
| H ₁₄ | Transformational leadership climate is positively related to firm-level employee performance. | Supported |
| H ₁₅ | Transformational leadership climate is positively related to trust. | Supported |
| H ₁₆ | Transformational leadership climate moderates the nexus between external numerical flexibility and firm-level employee performance positively. | Not evaluated |
| H ₁₇ | Trust mediates the nexus between transformational leadership climate and firm-level employee performance positively. | Not supported |

| | | |
|-----------------|--|---------------|
| H ₁₈ | Technological requirements of virtual leadership moderates the nexus between transformational leadership climate and internal numerical flexibility positively. | Not supported |
| H ₁₉ | Technological requirements of virtual leadership moderates the nexus between transformational leadership climate and firm-level employee performance positively. | Not supported |
| H ₂₀ | Technological requirements of virtual leadership moderates the nexus between transformational leadership climate and trust positively. | Not supported |
| H ₂₁ | Firm-level employee performance is positively related to operational performance. | Supported |
| H ₂₂ | Operational performance is positively related to financial performance. | Supported |
| H ₂₃ | Technological requirements of virtual leadership mediates the nexus between transformational leadership climate and internal numerical flexibility positively. | Supported |

5.3 Conclusion

The conclusion of this chapter is twofold: (1) a new scale has been established, i.e., technological requirements of virtual leadership, and (2) a new model has been developed and evaluated.

Referring to (1): Based on a multi-method procedure, five methods (item development, item sort task, pretest of substantive validity, exploratory and confirmatory factor analysis) were applied in order to successfully develop an innovative scale. This scale was established as a higher-order construct, containing two lower-order constructs, i.e., *competent usage of virtual media in communication with employees* as well as *(organizational) support to ensure the ability to work flexibly*. Both LOCs (each containing four items) as well as the HOC achieved very good construct reliability values. Thus, a new scale has been developed on the basis of a well-founded scientific procedure, capturing two major aspects when leading flexibly working employees. Finally, the innovative organizational-level scale is now usable for further quantitative as well as qualitative analysis.

According to (2): Based on a priori conducted research (systematic and narrative literature review as well as qualitative case study), a model (earlier named conceptual framework) has been established. This was analyzed using PLS-SEM in this chapter. Moreover, as the model

as well as this study, are a mixture of exploratory and explanatory research, the model was further developed, leading to a *final model on workplace flexibility practices, transformational leadership climate, technological requirements of virtual leadership, trust and HR commitment practices on SME performance indicators*, cf. figure 5.16, which includes the new technological requirements of virtual leadership as a mediating – instead of a moderating – construct. At this point it is important to state that no questionable research practices have been applied like HARKing or *p*-hacking. Instead, the process of hypotheses analysis as well as model development has always been presented transparently. Therefore, the findings were obtained based on a procedure that was planned in advance and then carried out transparently.

The findings highlight that leading SME employees who work flexibly is affected by the technological requirements of virtual leadership as it fully mediates significantly the nexus between transformational leadership climate and internal numerical flexibility ($\beta = .304, p = .000$). This finding is highly innovative as no other model contains this scale or raises this specific question. However, it is also highly relevant as technological requirements of virtual leadership as a mediator provides a deeper understanding of the aforementioned nexus. Now, it is clearer how transformational leadership climate influences internal numerical flexibility, in particular via the mediator.

In contrast to the flexibility firm theory (Chatterjee, Chaudhuri and Vrontis, 2022; Rodgers, 1992), internal numerical flexibility did not raise, or even affect, firm-level employee performance in SMEs. The detailed analysis in comparison to the literature will follow in the next chapter 6. Nevertheless, a model with at least a medium, or even a high predictive power was established, leading to very well interpretable results.

CHAPTER 6 CONCLUSION

6.0 Introduction

In this final chapter, the results of the quantitative study are compared with existing literature as well as the qualitative study. In addition, practical and theoretical implications as well as limitations of the mixed methods study conducted are presented, and an avenue for further research is provided. This chapter also closes with a brief conclusion.

6.1 Discussion of results: Cross validation and synthesis of qualitative and quantitative research

Now the statistical results of PLS-SEM are discussed in comparison to the qualitative study as well as existing literature.

H₁ and H₂ dealt with HR commitment practices influencing firm-level employee performance and internal numerical flexibility. H₁ is supported and thus in line with existing literature, stating that HR commitment practices enhance firm-level employee performance (Chen et al., 2017; Huselid, 1995; Latorre et al., 2016; McClean and Collins, 2011; Youndt et al., 1996). If companies are committed towards their employees by providing them multiple career paths or train their employees well, firm-level employee performance increases. HR commitment practices are, therefore, a useful investment, regarding increased performance. In line with previous research (cf. Iverson, 1996; Martínez-Sánchez, Pérez-Pérez et al., 2008), H₂ also showed a positive association between HR commitment practices and internal numerical flexibility, although it was not significant. Nevertheless, if companies communicate clearly to employees that they do not have to be afraid of the downsides of working flexibly, like not being promoted (cf. figure 2.5, number 1), this may increase the usage of internal numerical flexibility within a company. Therefore, it is recommended that SMEs use HR commitment practices to reduce employees' fears when working flexibly but also to enhance firm-level employee performance.

Procedural flexibility was associated with firm-level employee performance (H₃) in the model as employees can also participate in decision-making processes (Addison and Teixeira, 2003; Stewart and Spatz, 1993; Zapata-Phelan et al., 2009). Thus, the attitude is characterized as being more cooperative, combined with a positive work culture (Buultjens and Howard, 2001). Moreover, employees feel safer as management does not make decisions alone (e.g., on dismissing employees), leading to higher performance (Addison and Teixeira, 2003; Stewart and Spatz, 1993; Zapata-Phelan et al., 2009). In this quantitative study, H₃ underlined this positive (although not significant) relationship. Therefore, a higher degree of procedural flexibility may have a small impact on firm-level employee performance, which

cannot be secured against chance. The analysis uncovered that there is a very weak effect, close to no effect ($\beta = .035$, $p = .669$), but follows existing research referring to its positive direction.

Functional flexibility was linked to internal numerical flexibility (H_4) as well as firm-level employee performance (H_5) in the model. It is argued in the literature that multi-skilled and highly qualified employees that participate in job design and use job rotation have more opportunities to work flexibly (Desombre et al., 2006; Martínez-Sánchez, Pérez-Pérez et al., 2008). The findings of the quantitative study uncovered that there is no effect ($\beta = -.009$, $p = .920$). Although it has a negative direction, the effect size is zero. As a consequence, the amount of functional flexibility does not enhance or reduce working flexibly. Although it is still understandable that qualified employees, who can work in teams, are given the chance to work flexibly more often, job rotation in particular could be an obstacle to working flexibly. If employees change their jobs regularly, they do not enter a daily routine, regardless of where and when they work. This job rotation (as well as the involvement of employees in job planning and design) could lead to a very high degree of self-organization, which has been identified via the expert interviews as a necessary skill of flexible workers. This implies a need for further research as to how qualified a workforce must be for flexible work to be possible. However, participating in job designs and using job rotation leads to a high integration into the company and the team. Thus, employees are visible and part of teamwork (identified downsides). Functional flexibility is positively, but not statistically significantly, associated with firm-level employee performance ($\beta = .125$, $p = .125$). Thus, a very well qualified workforce which is involved in job design and planning yields a higher firm-level employee performance. This also indicates a higher level of identification with the company. Moreover, this finding is supported by the Job Demands-Resources Model (Bakker and Demerouti, 2007), underlining more resources (like being skilled to solve problems, focus on high-quality solutions, teamwork, involvement (reflecting motivation)) lead to higher outcomes.

Cost flexibility was related to internal numerical flexibility (H_6) and firm-level employee performance (H_7) as cost flexibility is understood as a monetary motivation of employees (Gittleman et al., 1998). Furthermore, having the opportunity to work flexibly additionally motivates employees (non-monetary) by making them feel privileged (Lautsch et al., 2009; Mann et al., 2000). The quantitative analysis uncovered a positive and significant effect between cost flexibility and internal numerical flexibility ($\beta = .189^{**}$, $p = .001$). Thus, if companies use remuneration systems like profit-related, commission or individual performance-

related pay, the degree of internal numerical flexibility increases. This probably indicates that rather highly-qualified employees may work flexibly (these employees typically receive such monetary motivation). Additionally, and in line with Martínez-Sánchez, Pérez-Pérez et al. (2008), employees recognize the employer's engagement and companies reflect an understanding of employees' needs (like being promoted and appreciated), leading to more flexible work due to higher cost flexibility. So, well established remuneration systems (i.e., a high degree of cost flexibility) are statistically significantly related to internal numerical flexibility in SMEs. This shines light on the question raised by Eamets and Jackson (2014) on how cost flexibility interacts with internal numerical flexibility. Cost flexibility is also very weakly related to firm-level employee performance ($\beta = .013$, $p = .852$), underlining that there is no significant effect. However, the effect is – although being very weak – positive, indicating that more cost flexibility may lead to higher firm-level employee performance due to its motivating effect.

Based on the literature as well as the interviews, a positive association between internal numerical flexibility and firm-level employee performance was expected. However, the PLS-SEM results uncovered that there was no effect ($\beta = .001$, $p = .987$). The effect size is zero and the relationship is not significant. This finding contradicts existing literature like Grzywacz et al. (2008) stating that “flexibility [...] provides a concrete lever to organizations for enhancing organizational performance” or Martínez-Sánchez, Pérez-Pérez et al. (2008) who presented a positive relationship (without presenting their measurement instrument, which raises concern due to lacking transparency). Furthermore, this finding disagrees with the flexibility firm theory (Chatterjee, Chaudhuri and Vrontis, 2022; Rodgers, 1992). This might be the case due to an organizational level study, focusing on the workforce but not on individual employees, indicating a need for a group comparison between the perspectives of leaders (organizational level) and employees (individual level). However, this is a major contrast to existing knowledge, establishing that working flexibly in SMEs does not affect firm-level employee performance. Nevertheless, no effect in PLS-SEM also underlines that working flexibly is not associated with lower firm-level employee performance. Thus, employers and leaders must not be afraid of reduced performance. Moreover, internal numerical flexibility is negatively and statistically significantly associated with employee absenteeism ($r = -.162$, $p < .05$) and employee turnover ($r = -.163$, $p < .05$), cf. correlation matrix. This is rather positive, also regarding the firm-level employee performance, because knowledge/human capital is not missing due to absenteeism or leaving the company permanently (employee turnover). However, the correlation matrix uncovered a statistically significant and positive association between firm-level employee performance and internal numerical

flexibility ($r = .314, p < .01$). This is interpreted as meaning that productive companies are more likely to allow their employees to work flexibly than those that face performance problems.

H₉, H₁₀ and H₁₆ could not be evaluated as external numerical flexibility was discarded from the model (due to lacking discriminant validity). Therefore, no further conclusions can be drawn on these hypotheses, i.e., the role of external numerical flexibility in the interplay of the other constructs. This again underlines the problem of a variety of constructs with several definitions in this research stream, while no consensus, based on a scientifically accepted scale development procedure, has emerged in the past.

The next hypothesis deals with the relationship between trust and internal numerical flexibility (H₁₁). Trust is harder to maintain in virtual teams but still highly important and understood as a glue within the workforce (Cascio, 2000; Crisp and Jarvenpaa, 2013; Jarvenpaa et al., 1998; O'Hara-Devereaux and Johansen, 1994). Although trust can sometimes be seen as low in flexible work (e.g., Bos et al., 2002; Rocco, 1998), the quantitative analysis showed up a positive relationship between trust and internal numerical flexibility ($\beta = .099, p = .239$). Despite not being significant, the result highlights that a higher degree of trust leads to more flexible work. This can be explained by the fact that employees who are not trusted are probably not given the option to work flexibly. This supports the findings of the qualitative study, which also underlined the relevance of trust when working flexibly. The interviewees highlighted that trust needs to be established between leader and employees but also among employees. The quantitative findings strengthen the qualitative findings in establishing and maintaining trust in flexible workforces, e.g., via virtual canteens or virtual team events and thus remedy the downside of lacking trust (no. 17 in figure 2.5). As this represents a leadership task, i.e., leaders need to implement trust building activities within the workforce, the next hypothesis deals with the influence of transformational leadership climate on trust (H₁₅). The results of the quantitative study show a positive, direct and strongly significant relationship ($\beta = .721, p = .000$), as anticipated. This underlines that transformational leaders are capable of establishing trust within a workforce, which supports the findings from the qualitative study. Therefore, transformational leaders are able to implement trust building activities, representing a requirement for working flexibly. Practically, they have to do it, as this was required by the interviewees. So, distrust in the workplace (as exemplified by Nordbäck et al. (2017)) can be remedied. Therefore, transformational leaders are enablers for working flexibly as they serve as role models and build and maintain trust within a workforce. Despite the expectations, trust is very weakly negatively associated with firm-level employee

performance ($H_{12} = \beta = -.022, p = .824$). Since this relationship is not significant and has no effect, it is not present in this study – neither positively, nor negatively. This is contradictory to prior research (cf. Crisp and Jarvenpaa, 2013; Mayer et al., 1995; Podsakoff et al., 1990). This might be the case because transformational leadership climate also explains a certain degree of trust (maintaining high degrees of integrity and honesty (Oberfield, 2014)). Moreover, trust is typically studied on a team or individual level, which might also have influenced these organizational level results.

A nexus between transformational leadership climate and internal numerical flexibility (H_{13}) was also anticipated (Mesu et al., 2013). Moreover, this relationship was expected to be moderated by technological requirements of virtual leadership (H_{18} , own hypothesis based on the interviews). The results of PLS-SEM analysis uncovered that there is a direct, positive and significant relationship between transformational leadership climate and internal numerical flexibility ($\beta = .176, p = .017$) in the initial model (without moderator or mediator analysis). Thus, a higher degree of transformational leadership climate enhances working flexibly in SMEs and probably remedies several downsides, such as not being satisfied and loyal (no. 6, cf. figure 2.5), being integrated in teamwork (no. 14), increased stress (no. 7), boundary management (no. 9), family-to-work (no. 10) or role conflicts (no. 11), isolation (no. 12) and less informal training (no 15). This is due to employees feeling free to discuss these issues honestly with their leaders in order to find a solution. If an organization is characterized by leaders generating and maintaining integrity, honesty, motivation, commitment, empowerment and innovation, employees tend to work flexibly more often in SMEs. This is a very important contribution since the aspect of leadership was missing in the guiding models from Whyman and Petrescu (2015) as well as Martínez-Sánchez, Pérez-Pérez et al. (2008) and not studied on an organizational level and including firm-level employee performance by Mesu et al. (2013). So, this quantitative study highlights that transformational leadership climate enhances (or eventually enables) working flexibly. The interviews support this viewpoint and underline that leaders showing transformational leader behavior are role models, e.g., they also work flexibly and thereby show their employees that they are allowed to work in this way as well. Additionally, transformational leaders bind employees to the vision, which motivates them, regardless of where and when they work. Transformational leaders also take care of each individual by also having high-performance expectations and stimulating each employee intellectually. Finally, the leader binds employees together as a team by valuing each individual wherever they are and whenever they work. This also enhances trust. Moreover, the interviews uncovered that technology might intervene in the relationship between transformational leadership and internal numerical flexibility. Thus, the developed

measurement instrument technological requirements of virtual leadership has been implemented as a moderator (H₁₈). No significant moderating effect was identified. The same results (no moderation by technological requirements of virtual leadership) arose on the relationships between transformational leadership climate and firm-level employee performance (H₁₉) and trust (H₂₀).

However, as this study also contains an exploratory part, an additional mediation analysis was conducted, while technological requirements of virtual leadership was expected to be the mediator on the nexus between transformational leadership climate and internal numerical flexibility (H₂₃). The analysis highlighted that the mediated relationship is positive and significant ($\beta = .304, p = .000$, even more significant than the direct nexus between transformational leadership climate and internal numerical flexibility). Since the direct effect became insignificant ($\beta = -.043, p = .637$) after introducing the mediator, a full mediation was established. Hence, the association between transformational leadership climate and internal numerical flexibility is explained by having and using technology appropriately. This finding underlines the relevance of using technology in managerial settings as it enables people to interact and therefore to prevent being less visible (downside no. 4, cf. figure 2.5), isolation (no. 12) as well as having access to relevant materials (no. 8). Moreover, it highlights the necessity to include technological requirements of virtual leadership when analyzing the nexus between (transformational) leadership and internal numerical flexibility in further analysis. Thus, the statement from the interviewees, which asserts that technology is hindering or supporting leadership when employees work flexibly, was supported through the PLS-SEM mediation analysis.

Based on prior research, relationships between transformational leadership climate and firm-level employee performance (H₁₄, cf. Moon (2016), Podsakoff (1990), Van Wart (2019)) and trust (H₁₅, cf. Braun et al. (2013), Jena et al. (2018), Podsakoff et al. (1990), Yukl (1989)) were anticipated. Both hypotheses were supported due to the quantitative results (H₁₄ = $\beta = .393, p = .000$; H₁₅ = $\beta = .721, p = .000$). So, transformational leadership climate has the power to enhance performance as well as trust. This also comes in line with the findings of the qualitative interviews, that leaders can enhance trust, e.g., by being a role model or fostering teamwork (remedying downside no. 14, cf. figure 2.5). Moreover, it was expected that trust positively mediates the nexus between transformational leadership climate and firm-level employee performance (H₁₇). Although this relationship was analyzed in earlier studies (Braun et al., 2013; Jena et al., 2018; Podsakoff et al., 1990; Yukl, 1989), it was not replicated in this study. One reason could be that transformational leadership is typically not

studied on organizational, but rather on individual or team level. Thus, there is no mediation by trust on the nexus between transformational leadership climate and firm-level employee performance on an organizational level.

Finally, firm-level employee performance was expected to predict operational performance (H_{21} , cf. Jiang et al. (2012), Ketkar and Sett (2009)) which was expected to predict financial performance (H_{22} , cf. Jiang et al. (2012), Ketkar and Sett (2009)). Both hypotheses were supported ($H_{21} = \beta = .598, p = .000$; $H_{22} = \beta = .378, p = .000$). Thus, a higher firm-level employee performance enhances operational performance which finally enhances financial performance. Therefore, the triptych was presented in this study as well. So, if SMEs strive to enhance performance, they have to use transformational leadership climate and HR commitment practices as these enhance firm-level employee performance positively and significantly. Functional flexibility also enhances firm-level employee performance in SMEs, although it is not significant. Thus, these two levers enhance firm-level employee performance which enhances operational and finally financial performance of SMEs.

6.2 Managerial implications

From the managerial perspective, the mixed methods study uncovered relevant insights, which SMEs can benefit from. First, the interviews uncovered that flexibly working employees need to be led according to the transformational leadership style. Being a role model, forming a team by dealing with every employee individually, supporting employees, stimulating them intellectually, having high-performance expectations as well as leading them in line with the vision of the company serve as a guideline for leaders in those working environments. This has also been underlined by the quantitative analysis which uncovered a direct link between transformational leadership climate and internal numerical flexibility (initial analysis) as well as a relationship between those two constructs mediated by technological requirements of virtual leadership. Nevertheless, it is important to state that leaders must take time for leadership tasks. This is even more important when employees work flexibly because leadership is more complex.

Second, trust is a relevant element when employees work flexibly. Trust is – in this case – twofold. On the one hand, it needs to be established between leaders and employees. Being a transformational leader fosters trust (cf. qualitative and quantitative results). On the other hand, employees must also trust each other. So, leaders must have enough confidence that they do not assume their employees are out of the office and, consequently, unproductive. Leaders must have faith in their employees that they will do their jobs conscientiously, regardless of where and when they work. This second dimension must not be forgotten,

because there is no social control (employee 1 does not see whether his/her colleague is sitting at his/her desk in the office at 8 o'clock, as usual). It is important to note that presence does not mean productivity. There must be enough mutual trust among the employees to avoid the impression that one of them is working flexibly and therefore working less. To satisfy both parties, companies should use trust-building activities. These can, of course, also be carried out virtually. Virtual team events in which employees (and leaders) get to know each other better, exchange information informally, and build or strengthen trust. This can also be a starting point for further informal exchanges, for example in a virtual canteen.

Third, technology must be discussed when employees work flexibly. As already mentioned in the first enumeration, technological requirements of virtual leadership serves as a mediator on the nexus between transformational leadership (climate) and internal numerical flexibility. Thus, organizations must equip both leaders and employees with the required technology. When employees work flexibly, the quality of technology is highly important. Due to high-quality webcams, facial expressions and gestures become visible. This circumvents mistakes which can arise in discussions (between leader and employee or among employees), as long as everyone involved is trained in the use of technology.

Fourth, the quantitative analysis uncovered that working flexibly does not affect firm-level employee performance. This is a counterstatement against studies on an individual level. However, the recommendation to implement this workplace flexibility practice remains for a number of reasons. There is a huge demand from the employment market to offer it (cf. Weitzel et al. (2019)). Therefore, according to Spence's (1973) signaling theory, implementing flexible work sends a positive signal to the employment market in order to gain an advantage in the war for talent. This can therefore be a sustained competitive advantage, according to Barney's (1991) resource-based view, in order to successfully recruit highly qualified and high-performing employees. Furthermore, flexible work is a signal towards the company's workforce that the organization with its leaders trusts their employees. Offering this workplace flexibility practice is not considered to be problematic. The quantitative study underlined that there is no relationship between internal numerical flexibility and firm-level employee performance. This implies that there is also no negative association, i.e., working flexibly does not lower firm-level employee performance. Moreover, the correlation matrix shows that internal numerical flexibility is negatively statistically significantly related to employee absenteeism ($r = -.162, p < .05$) and employee turnover ($r = -.163, p < .05$). Thus, it is beneficial for companies. Furthermore, virtual socializing glues the workforce together, and every employee is equipped with the necessary technology. As a consequence,

employees are more likely to become attached to the company, meaning that human capital remains within the company. So, finally the workplace flexibility practice, implemented by the (strategic) HRM, indirectly influences the success of the company via recruiting and retaining highly qualified employees.

6.3 Theoretical implication

In the following, the theoretical implications and therefore the contribution to theory of this PhD thesis will be discussed.

First, the available scales for measuring WFPs have certain weaknesses. There are a variety of scales with the same label/name. So, it is reasonable to assume that they measure the same thing. But this is not the case as the definitions and operationalizations for the constructs vary. One example: Whyman and Petrescu (2015, p. 1098) define numerical flexibility “as the adjustment of the number of workers or of their working time”. This is operationalized through the following items “Firms using these WFPs: Working from home; or Tele-working; or Mobile working” [sic], “Family friendly practices”, “Part-time working” and “Flexitime” (2015, p. 1124). Martínez-Sánchez, Pérez-Pérez et al. (2008) define numerical flexibility and differentiate it into internal and external numerical flexibility. Internal numerical flexibility is operationalized as “the variables of labour flexibility were measured by the number of employees using these practices divided by the total number of employees in the firm” (Martínez-Sánchez, Pérez-Pérez et al., 2008, p. 19). External numerical flexibility is defined as “the group of external numerical flexibility are: temporary, fixed-term employees, contingent employees, and layoffs” (Martínez-Sánchez, Pérez-Pérez et al., 2008, p. 19). However, three years later, Martínez-Sánchez et al. (2011) stipulate that internal numerical flexibility is a combination of the constructs of internal numerical as well as functional flexibility, which includes even more and different items in comparison to Whyman and Petrescu’s (2015) understanding. These examples highlight that the measurement of certain constructs is not based on solid definitions and theories. Thus, WFP scales have never been developed appropriately following a scientific multi-method scale development procedure. Therefore, these WFP scales are very close together, in terms of their measured items. This is probably the reason why discriminant validity could not be established in the PLS-SEM analysis, although a well-developed and validated scale on internal numerical flexibility (cf. Poethke et al., 2019) has been used, i.e., internal numerical flexibility in Whyman and Petrescu (2015) understanding. Therefore and based on this finding, it is necessary to finally develop all WFP scales newly and thoroughly, following the scientific standard so these problems will not occur again.

Second, a new conceptual framework of workplace flexibility practices, transformational leadership, trust and intra-team communication on SME performance indicators has been developed. This framework combines all five WFPs on the organizational level for the first time. It is assumed that this has not been done before due to the obscure picture with regard to the inconsistent scales (cf. 1). However, the identified and categorized downsides have been implemented into the framework as individual demands, referring to the Job Demands-Resources Model (JD-R). In addition, resources have also been implemented which are trust, intra-team communication, transformational leadership and technology/ICT. The resources have been implemented on a team-level, but can also be characterized as organizational level (cf. final organizational model, analyzed with PLS-SEM). Leadership as well as technology have not been implemented in a conceptual framework, including all WFPs, and was also missing in the guiding models by Martínez-Sánchez, Pérez-Pérez et al. (2008) as well as Whyman and Petrescu (2015), constituting another theoretical contribution. Although the conceptual framework was built on existing studies and theoretically grounded on the JD-R as well as the flexibility firm theory (Chatterjee, Chaudhuri and Vrontis, 2022; Rodgers, 1992), no effect from working flexibly on firm-level employee performance was identified, although it was theoretically anticipated. This might be the case since demands and resources are compensating each other and working flexibly enhances individual employee performance indicators like turnover and absenteeism, as uncovered by the correlation analysis, instead of firm-level employee performance. Thus, employees are more closely tied to the company but are not performing better. Therefore, working flexibly is rather a benefit for retaining (and probably recruiting) employees instead of leveraging performance. This is also a theoretical contribution as it highlights that the flexibility firm theory, which states that employee efficiency will be improved, has to be revisited and revised in this regard. In addition, the aspects of leadership and usage of technology are also missing in the flexibility firm theory, which have to be included based on the analysis of this PhD thesis.

Third, a new scale on technological requirements for virtual leadership has been developed, following the call from the interviewees as well as from Van Wart et al. (2017). This validated scale (construct reliability .886) combines competent usage of virtual media in communication with employees as well as (organizational) support to ensure the ability to work flexibly and represents a contribution to theory itself. However, the PLS-SEM analysis uncovered that this scale intervenes in the nexus between transformational leadership climate and internal numerical flexibility, as expressed by the interviewees. Accordingly, there is a need to include the gained insights from the qualitative study, i.e., importance of technology when leading flexibly working SME employees, and implement it into leadership theories.

Existing theories, like in this case transformational leadership, are quite old, having been founded by Burns in 1978 and further developed by other researchers like Bass (1985) and Podsakoff et al. (1990). The demand of using technology has developed during this period of time. Therefore, it is necessary to theoretically conceptualize a technology-leadership-theory, combining the insights from the qualitative study on technological requirements for virtual leadership with leadership behaviors. Yukl (2015, p. 464) also calls for an integrated analysis of leadership by stating “research on effects of leader behavior has examined how often the behavior is used, but the effects also depend on other conditions that are seldom considered”. Such a combination of technology and leadership is currently lacking, although it would be appropriate for the digitized world. However, it has already been defined by Van Wart et al. (2019, p. 4) as “E-leadership is the effective use and blending of electronic and traditional methods of communication. It implies an awareness of current ICTs, selective adoption of new ICTs for oneself and the organization, and technical competence in using those ICTs selected”. Here, as in the case of WFPs, it is obvious that there is no uniform term and definition, as other researchers (e.g., Cordova-Buiza et al., 2022; Ibrahim, 2015; Roy, 2012) refer to virtual leadership in this context. This underlines that there is no theoretically built valid leadership model, including technology. However, the combination of leadership and technology has not been theoretically conceptualized or operationalized via scale development before. Thus, it represents another theoretical implication.

6.4 Limitations of research

Despite the findings of this research, this study has several underlying limitations. First, the systematic literature review uses inclusion and exclusion criteria for structuring the analysis. Thus, papers are also systematically excluded, highlighting that a systematic literature review is not holistic. In order to circumvent this limitation, an additional narrative literature review has been conducted. However, relevant papers will probably be missed, as a literature review itself is never all-encompassing.

Second, the literature as a data source is also a limitation, as a focus was set on journal papers stemming from business management research. Thus, related research streams were excluded even though they could add an alternative perspective, like architecture, where workplaces are also discussed (cf. Barber et al. (2005) and Habscheid-Führer and Grothaus (2016)). Moreover, conference papers could also be included in following systematic literature reviews, as they often go through a peer-review process and are up to date. Furthermore, non-academic literature could be used for gaining more recent insights from the managerial perspective.

Third, the ambitious goal of integrating all downsides of working flexibly as well as all WFPs in a single all-encompassing conceptual framework is challenging. As there are no clear definitions in this research stream, it cannot be said with certainty that all relevant aspects have been included. Nevertheless, this gap has been identified and filled.

Fourth, the qualitative study as well as the quantitative studies focused on analyzing the perspectives of leaders. In order to achieve more diverse findings, flexibly working employees could also be analyzed. Afterwards, the results can be compared to identify overlaps and differences between leaders and employees. Moreover, it could be necessary to compare the results with leaders who have not implemented flexible work in order to highlight their fears of doing so.

Fifth, the mixed methods study was conducted during the COVID-19 pandemic, which was the starting point for many companies to consider or to deal with flexible work. This could change the status quo significantly. Therefore, the results could be different if the mixed methods study were to be repeated in a few months or years.

Sixth, due to its sampling, the research was limited to German SMEs. As a result, cross-national/-cultural comparisons are not possible. However, due to the sampling strategy, the focus was set well. In order not to be restricted to a certain industry, the interviewees and participants were generated from various industries. Moreover, no conclusions can be drawn regarding larger companies, since SMEs were analyzed, although a comparison between large companies and SMEs would be interesting in the future.

Seventh, due to the absence of standardized and well-established scales in this research stream, available scales on WFPs have been used, although very clear definitions are lacking. Thus, problems with discriminant validity arose during the PLS-SEM analysis. The scales present in literature (e.g., Martínez-Sánchez et al., 2011; Martínez-Sánchez, Pérez-Pérez et al., 2008; Whyman and Petrescu, 2015) are not well developed. Therefore, scales are presented as “Internal numerical flexibility includes flexitime and workload reduction” (Martínez-Sánchez et al., 2011, p. 725), despite being published in high-quality journals. The item formulation is not precise, e.g., “We provide training focused on team building, teamwork skills and new information technologies” (Martínez-Sánchez, Pérez-Pérez et al., 2008, p. 21) or “Firm using these WFPs: Working from home; or Tele-working; or Mobile working” (Whyman and Petrescu, 2015, p. 1124). Participants of surveys will probably be confused – what if they use teleworking, but are not working from home or vice versa? What if training is provided on information technology but not on team building? This leads to imprecise

answers of participants or them ticking the ‘cannot answer’ option. Moreover, the definitions of which items belong to a certain scale vary (e.g., internal numerical flexibility, cf. Whyman and Petrescu (2015) versus Martínez-Sánchez, Pérez-Pérez et al. (2008)). Consequently, the scale can be interpreted differently, although it should measure the same. Therefore, poorly scientifically operationalized scales developed and were/are used. This represents rather a limitation of this research stream, from which this study is also affected since the developed model is based on – at least partially – poor quality literature.

Eighth, based on a technical problem, one of the 15 items of the scale technological requirements of virtual leadership was eliminated. This could have changed the CFA results of the scale. However, the results of the CFA are in line with the findings of the EFA. Thus, they are interpreted as being usable.

Ninth, the mixed methods study was conducted in a cross-sectional time horizon. Thus, the results can be biased, e.g., by endogeneity. When drawing causal claims (like x causes y) it is important to understand that eventually z causes both, x and y – leading to a situation in which endogeneity occurs due to omitted variables (Antonakis et al., 2014; Jacquart et al., 2018). Researchers try to address the level of endogeneity by simulating the size of the effect of an omitted variable upon the observed outcome (Cinelli and Hazlett, 2020; Clarke, 2009). The impact threshold for a confounding variable (ITCV) has thus gained momentum in current research studies and is often reported for controlling the omitted variable bias (e.g., Chiu et al., 2022; Fischer-Kreer et al., 2021; Guo et al., 2021; Hennig et al., 2022). However, it is – so far – not possible to use the ITCV when PLS-SEM is applied. Thus, the limitation arises that no statistical analyses were conducted on whether endogeneity affects the results. However, according to Busenbark et al. (2022), it is unlikely that much of the causal inference published is biased by omitted variables. Thus, the results are interpreted as being usable, due to a very well-founded conceptual framework based on literature and theory.

Tenth, this study is lacking representativity. Since qualitative studies do not strive for representativity, this limitation focuses on the quantitative study. 173 leaders from 173 different German SMEs participated in this quantitative study. This is equated to .007% of German SMEs. As participants were recruited from different industries, it is possible to transfer the results as they are not confined to one industry. Moreover, the researcher is aware of difficulties in generating data from SMEs due to typically low response rates (Gabrielli and Balboni, 2010; Whyman and Petrescu, 2015). The distribution of participating companies in the quantitative analysis differs from the distribution in Germany. In Germany, according to the Statistisches Bundesamt (2022), there are 2.6% medium, 14.9% small and 81.9% micro

companies. In this study, 38.73% from medium, 33.53% from small and 27.75% from micro companies participated. Thus, the sample is not representative according to the distribution of the companies in terms of size, although all participating companies are SMEs. Nevertheless, due to the sample size, the results should be carefully interpreted. However, the sample size of this study is higher than average in HRM research. In published journal papers, the association of sample size and representativity is often not discussed.

6.5 Implications for further research

Derived from the conducted mixed methods study, there are several implications for a future research agenda. First, the systematic literature review should be repeated after the COVID-19 pandemic. This acted as an ignition and brought the niche topic into a global limelight. Thus, research on working flexibly was enhanced and probably produced new outputs and therefore insights. These should again be summarized in a systematic literature review in order to continuously develop this research stream further in a structured manner.

Second, there is a need for an additional conceptual framework focusing on advantages of WFPs in SMEs again as they are under-researched. This would help to understand how working flexibly positively affects an organization, a team or an individual. These insights could, for instance, be related to recruitment or retainment purposes. Thus, there is a call for another multi-level conceptual framework following another goal.

Third, apart from SMEs, there are several different settings in which the new scale (technological requirements of virtual leadership) should be used. Thus, the influence of the new scale as a mediating construct should also be analyzed in large companies. Moreover, it could be used in (higher) education, where teachers/professors are leading their students who study flexibly (distance learning). Additionally, the scale should be used in companies which have a high degree of flexibly working employees. This could also uncover different results in comparison to this study.

Fourth, the conceptual framework should be analyzed in a multi-level study. This identifies effects between the three layers (organizational, team, individual) and includes a variety of perspectives, i.e., leaders, teams and individual employees. This should be designed as a longitudinal study, striving at explaining causal relationships in depth.

Fifth, this mixed method study should be repeated on an individual level. Afterwards, a comparison between leaders' and employees' viewpoints is possible. Thus, overlaps or differences can be uncovered and addressed.

Sixth, the revised conceptual framework of workplace flexibility practices, transformational leadership, trust and intra-team communication on SME performance indicators was enhanced by the managing a flexible workforce construct. This construct was also missing in existing models in the literature, although the interviewees uncovered its relevance as it is not only important to lead flexibly working SME employees, but also to manage them (organizational tasks like facilitating informal communication). However, the construct needs to be further specified, i.e., a new scale has to be developed, which can later be used for further (especially quantitative) analysis. This would allow for further exploration of how leadership, management and technology interact when employees work flexibly.

Seventh, standard definitions, including validated scales, should be developed and established for all WFPs. Then, a consensus for those will arise. After that, there is no more ambiguity or vagueness as to what exactly the scale entails, how it is differentiated from the other WFPs, and what the proposition of the scale – and consequently of the relationships analyzed – is. In this respect, it may be necessary to develop completely new scales on the basis of a scientifically accepted scale development process. These could even lead to a higher-order construct combining several WFPs, if necessary. Subsequently, there should also be no more problems according to discriminant validity (as with external numerical flexibility in PLS-SEM analysis).

Eighth, after establishing new scales, the role of external numerical flexibility should be analyzed again. The interaction of internal as well as external numerical flexibility (and the other WFPs), especially when using the new scale technological requirements of virtual leadership (as a potential mediator between leadership and external numerical flexibility), probably uncovers further insights for this research stream.

Ninth, the new scale technological requirements of virtual leadership has in this quantitative study been used in association with transformational leadership climate, since this was expected to be suited well to working flexibly (Mesu et al., 2013). However, this scale could also fit well when other leadership styles are applied. Eventually, this scale even sets the foundation for using other leadership styles when employees work flexibly, as technology allows leaders to reach employees. Thus, further analyses on these topics are recommended.

Tenth, the interviews uncovered that leaders as well as employees need to be trained in using ICT. The consequence would be that employees and leaders have fewer misunderstandings, communication flows are better and performance may increase. Thus, it is an interesting avenue for further research to evaluate how company/or employee performance develops

after training. In this regard, a field experiment could be conducted in which the leader/employee behavior and performance changes in comparison to untrained people.

Eleventh, the governance of a family firm can influence the way HR practices, leadership styles or the integration and usage of ICT are applied within a company. This might differ in comparison to non-family firms. Thus, it is recommended to conduct a comparative analysis, in which (non-)family firms are compared in relation to the aforementioned issues, leading to theoretical as well as managerial implications for the role of the family business. Therefore, the family business could be integrated as a control variable in further quantitative analysis.

Twelfth, international comparative analysis can in the future lead to insights on how the national culture influences trust, workplace flexibility or the HR management style since Jones et al. (2008) already called for this analysis. Thus, further qualitative or quantitative research can explore the role of culture in this research stream.

Thirteenth, further research should focus on the role of external actors which might affect the conceptual model. Business or social networks, customers, suppliers or subcontractors (the SME could also be a subcontractor from a large corporation) could influence the behavior of an organization regarding its flexibility or management style. This might also affect the company performance, although the origin is outside the firm, i.e., external actors.

Fourteenth, as discussed in the managerial implications, it is expected that working flexibly serves as a signal which either helps to recruit or to bind highly-qualified employees in the war for talent. This also calls for further research in order to validate this consideration, eventually by developing a new theory in this regard.

Fifteenth, experimental research studies are expected to foster a deeper understanding on cause-and-effect relationships. Thus, experiments should be conducted in the future. An example would be that in a company (possibly with two locations), some of the leaders are trained on how they can commit themselves as leaders (and therefore as employers) to the employees. A second group of managers is also trained, but on a completely different topic. Now it is analyzed whether employees whose leaders have been trained with regard to commitment (treatment group) work more flexibly than those in the other group (control group). Measurements are taken before and after the training. Thus, changes in the extent of flexible working – if any – are undoubtedly due to the organization's higher commitment to the employees. A causal relationship would then be established.

6.6 Conclusion

In this final conclusion, the RQs, the ROs, the aim as well as the gaps will be revisited. RQ1 dealt with the question of which variables related to employees who are working in flexible workplaces (RQ1a) and to the socio-technological environment (RQ1b) increase or decrease company performance. The multi-level conceptual framework visualized all anticipated relationships of influencing variables. The main finding concerning RQ1a was that trust among employees – which has to be built and maintained by the leaders – is a necessary condition. This binds a team together and circumvents distrust and envy. Moreover, certain downsides might affect employees. Thus, these have been incorporated in the conceptual framework as demands. Referring to RQ1b, the availability, usage and relevance of technology increased when leading flexibly working SME employees. Although it is widely used, it can cause problems, which is one of the main findings. What seems trivial at first glance, however, is actually not because research in the field of WFPs has not yet recognized the relevance of technology or – due to a lack of scale – has not taken it into account. In this regard, organizations need to equip their leaders and employees adequately with technology and train them in its usage. Then leaders can apply these technologies in their leadership. As highlighted by the interviewees, technology intervenes in the nexus between leadership and working flexibly.

Downsides of working flexibly (RQ2) have also been identified through the literature review. These have been structured into four categories (occupational, private, social and financial downsides) and remedies were incorporated in the conceptual framework as well. Moreover, and in connection with the main finding of RQ1a, distrust was also identified through the interviews as an inhibiting factor, which has to be circumvented by trust-building activities and appropriate leadership behaviors.

In order to analyze the intensity of certain relationships (RQ3), PLS-SEM has been applied. This uncovered that WFPs had no impact on firm-level employee performance on an organizational level, although it was expected. But the analysis uncovered a mediating effect of technological requirements of virtual leadership on the nexus of transformational leadership climate and internal numerical flexibility. This underlines the necessity of being competent in using technology on the one hand and the necessity for organizational support on providing the technology on the other as this intervenes in the aforementioned relationship. Moreover, this again shows the linkage between RQ3 and RQ1b. The detailed answers to the research questions have already been given in earlier chapters, while the above paragraphs are a very brief summary.

In addition, all RO have been achieved because the relevant literature in the field of flexible workplaces was examined and a conceptual framework as a foundation for this research was established (RO1). Moreover, influencing factors of flexible workplaces on company performance with respect to employers, employees and the socio-technological environment were identified and considered (RO2). A causal model was developed as a new contribution to knowledge explaining the nature of the factors' relationship, such as moderating/mediating effects and the intensity and direction of the variables related to the performance of employees working in flexible workplaces (RO3). A new scale containing technological aspects of leading flexibly working employees as a new contribution to knowledge has also been developed (RO4). The aim, to investigate variables that increase or decrease company performance if employees work in flexible workplaces, was therefore achieved through the implementation of mixed methods research.

Furthermore, this mixed method study contributed to closing the research gaps: (1) Grzywacz et al. (2008) and Nordbäck et al. (2017) call for more knowledge on flexibility as well as communication, and referring to Nordbäck et al. (2017) also in different countries (besides Finland). The mixed methods study conducted within this PhD thesis was located in Germany and also focused on how communication works, especially by using ICT, representing (2) since Golden and Veiga (2008) as well as Martínez-Sánchez et al. (2007) asked for more clarity about this issue. The interviewees highlighted the need to use technology appropriately. So, a new scale was developed as the relevance was identified through the interviews, existing models are lacking this construct and there was no operationalization for measuring it. (3) A broader perspective of working flexibly (not focused on telework or work from home) was studied, as requested by Allen et al. (2013), Biron and van Veldhoven (2016) as well as Hislop and Axtell (2009) and Masuda et al. (2017). (4) Mesu et al. (2013) further ask why the amount of flexibility is not higher in SMEs. This study has helped to generate more knowledge about these issues in SMEs. (5) Kingma (2016) indicates that working flexibly leads to work continuity, without specifying it, thus a link to performance was expected. Martínez-Sánchez, Pérez-Pérez et al. (2008, p. 24) as well as Whyman et al. (2015) also call for additional information on the potential impact of "workplace flexibility on firm performance". However, taking the quantitative results into account, there is no link to firm-level employee performance, but it can establish a stable workforce and lead to continuity, which provides an additional argument for retaining employees. (6) Following the gap identified by Petrulaitiene et al. (2017), this research was not bound to one company but a more comprehensive cross-company result was generated. (7) Ge et al. (2018) call for more studies on flexitime, not only on flexible workplaces. This was also considered in this mixed

methods study since both aspects were included in the flexibility scale as well as in the qualitative expert interviews. (8) Whyman et al. (2015) highlight that even an empirical or theoretical foundation is missing which underlines the interplay between WFPs and company performance. This has been closed firstly by the multi-level conceptual framework and secondly by the PLS-SEM analysis. (9) Kotey (2017) as well as Whyman et al. (2015) call for additional research on flexible work in SMEs. This mixed method study contributes to this gap as it was conducted in SMEs. Summing this up, in this PhD thesis all WFPs (not only one or two) were related to other constructs, especially technology, on three levels (individual, team, organizational) in a conceptual framework for SMEs and the effects on firm-level employee performance. Afterwards, the effects on an organizational level were analyzed quantitatively. Moreover, a new scale was developed. This technological requirements of virtual leadership shines light on communication flows between leaders and flexibly working SME employees.

Moreover, managerial and theoretical implications were provided, as well as limitations. Finally, an avenue for further research has been presented as there are still open gaps, calling for more knowledge on WFPs in SMEs in the future. This is important as the way of work will probably change. In the eighties, Toffler (1980; 1980) proposed a shift of work away from the traditional company facilities. But how will the world of work change in the next ten to 15 years? Flexibilization could increase while interaction between humans and machines will expand within companies. Therefore, future research should focus even more on the connection between flexibilization and technology use. In this way, research can contribute to ethically, socially, physiologically and psychologically acceptable and sustainable working conditions and support entrepreneurs/human resources departments in their decisions in favor of or against WFPs.

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Appendices

Appendix I: Systematic literature review: Included articles due to abstracts read

| | Database | EBSCOhost | | | | | | | | | | | | | | | | | | | |
|--|----------|-----------|---------|-----------|-----------|---------|-----------|-----------|---------|-----------|-----------|---------|-----------|---------|---------|-----------|---------|---------|-----------|---------|---------|
| | Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| Criteria | | | | | | | | | | | | | | | | | | | | | |
| flexible (third) workplace or comparable | | ✓ | x | ✓ | ✓ | x | ✓ | ✓ | x | ✓ | ✓ | x | ✓ | x | x | ✓ | x | x | ✓ | ✓ | x |
| performance | | x | x | x | ✓ | x | ✓ | ✓ | ✓ | ✓ | ✓ | x | x | x | x | x | x | x | ✓ | x | x |
| motivation | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| other (in-) dependent variables | | ✓ | x | ✓ | ✓ | x | ✓ | ✓ | ✓ | ✓ | ✓ | x | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| primary research | | x | ✓ | ✓ | ✓ | x | ✓ | ✓ | ✓ | ✓ | ✓ | x | ✓ | ✓ | ✓ | ✓ | ✓ | x | ✓ | x | ✓ |
| Action | | full text | exclude | full text | full text | exclude | full text | full text | exclude | full text | full text | exclude | full text | exclude | exclude | full text | exclude | exclude | full text | exclude | exclude |

| | Database | EBSCOhost | | | | | | | | | | | | | | | | | | | |
|--|----------|-----------|---------|---------|---------|---------|-----------|---------|-----------|---------|---------|-----------|---------|---------|-----------|---------|---------|---------|-----------|-----------|---------|
| | Number | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| Criteria | | | | | | | | | | | | | | | | | | | | | |
| flexible (third) workplace or comparable | | ✓ | x | x | x | ✓ | ✓ | x | ✓ | x | x | ✓ | ✓ | ✓ | ✓ | ✓ | x | x | ✓ | ✓ | x |
| performance | | x | x | x | x | ✓ | ✓ | x | x | x | x | ✓ | ✓ | ✓ | x | x | x | x | x | x | x |
| motivation | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| other (in-) dependent variables | | ✓ | x | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | x | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | x | x | ✓ | ✓ | x |
| primary research | | x | ✓ | x | x | x | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | x | ✓ | x | ✓ | ✓ | ✓ | ✓ | x |
| Action | | exclude | exclude | exclude | exclude | exclude | full text | exclude | full text | exclude | exclude | full text | exclude | exclude | full text | exclude | exclude | exclude | full text | full text | exclude |

| | Database | EBSCOhost | | | | | | | | | | | | | | | | | | | |
|--|----------|-----------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|---------|
| | Number | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| Criteria | | | | | | | | | | | | | | | | | | | | | |
| flexible (third) workplace or comparable | | ✓ | ✓ | ✓ | x | x | ✓ | x | ✓ | ✓ | ✓ | x | ✓ | x | x | x | x | x | x | ✓ | ✓ |
| performance | | x | x | x | x | ✓ | x | x | x | x | x | x | ✓ | x | x | ✓ | x | x | x | ✓ | x |
| motivation | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| other (in-) dependent variables | | ✓ | ✓ | ✓ | x | x | x | x | ✓ | x | ✓ | x | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | x | ✓ | x |
| primary research | | ✓ | ✓ | x | x | x | ✓ | x | x | x | x | x | x | x | x | ✓ | x | x | x | ✓ | x |
| Action | | full text | full text | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | full text | exclude |

| | Database | EBSCOhost | | | | | | | | | | | | | | | | | | | |
|--|----------|-----------|-----------|---------|-----------|---------|---------|---------|-----------|---------|---------|---------|---------|---------|---------|---------|-----------|---------|-----------|---------|-----------|
| | Number | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| Criteria | | | | | | | | | | | | | | | | | | | | | |
| flexible (third) workplace or comparable | | ✓ | ✓ | x | ✓ | x | x | ✓ | ✓ | x | ✓ | x | x | x | ✓ | x | ✓ | x | ✓ | ✓ | ✓ |
| performance | | x | x | x | x | x | x | x | ✓ | x | x | ✓ | x | ✓ | ✓ | x | ✓ | ✓ | ✓ | x | ✓ |
| motivation | | x | x | x | x | x | x | x | x | x | x | ✓ | x | x | x | x | x | x | x | x | x |
| other (in-) dependent variables | | ✓ | ✓ | x | ✓ | x | x | x | x | x | x | ✓ | x | ✓ | ✓ | x | ✓ | x | ✓ | ✓ | ✓ |
| primary research | | x | ✓ | x | ✓ | ✓ | x | x | ✓ | x | ✓ | ✓ | ✓ | x | x | ✓ | ✓ | ✓ | ✓ | x | ✓ |
| Action | | exclude | full text | exclude | full text | exclude | exclude | exclude | full text | exclude | exclude | exclude | exclude | exclude | exclude | exclude | full text | exclude | full text | exclude | full text |

| | Database | EBSCOhost | | | | | | | | | | | | | | | | | | | |
|--|----------|-----------|-----------|-----------|-----------|---------|---------|-----------|---------|---------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | Number | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
| Criteria | | | | | | | | | | | | | | | | | | | | | |
| flexible (third) workplace or comparable | | x | ✓ | ✓ | ✓ | ✓ | x | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | x | x | ✓ | ✓ | x | x | x |
| performance | | x | x | ✓ | x | x | x | x | x | x | x | x | x | x | x | x | ✓ | x | x | x | x |
| motivation | | x | x | x | x | x | x | x | x | x | x | x | ✓ | x | x | ✓ | x | x | x | x | x |
| other (in-) dependent variables | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | x | ✓ | ✓ | ✓ | x | ✓ | ✓ | ✓ | ✓ | x | ✓ | ✓ |
| primary research | | ✓ | ✓ | ✓ | ✓ | x | ✓ | ✓ | x | x | ✓ | x | x | x | ✓ | ✓ | x | x | x | x | x |
| Action | | exclude | full text | full text | full text | exclude | exclude | full text | exclude | exclude | full text | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude |

| | Database | EBSCOhost | | | | | | | | | | | | | | | | | | | |
|--|----------|-----------|---------|-----------|---------|---------|-----------|-----------|---------|-----------|-----------|---------|---------|---------|---------|---------|---------|---------|-----------|---------|-----------|
| Criteria | Number | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 |
| flexible (third) workplace or comparable | | ✓ | ✓ | ✓ | × | × | ✓ | ✓ | × | ✓ | ✓ | × | ✓ | ✓ | ✓ | ✓ | × | × | ✓ | ✓ | ✓ |
| performance | | ✓ | ✓ | ✓ | × | ✓ | × | × | ✓ | ✓ | × | × | ✓ | ✓ | × | × | × | × | × | × | × |
| motivation | | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × |
| other (in-) dependent variables | | ✓ | ✓ | × | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| primary research | | ✓ | × | ✓ | ✓ | × | ✓ | ✓ | × | ✓ | ✓ | ✓ | × | × | × | × | ✓ | ✓ | ✓ | × | ✓ |
| Action | | full text | exclude | full text | exclude | exclude | full text | full text | exclude | full text | full text | exclude | exclude | exclude | exclude | exclude | exclude | exclude | full text | exclude | full text |

| | Database | Emerald Management 200 | | | | | | | | | | | | | | | | | | | |
|--|----------|------------------------|---------|---------|---------|-----------|---------|---------|-----------|---------|---------|-----------|---------|---------|---------|---------|-----------|---------|---------|---------|---------|
| | Number | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 |
| Criteria | | | | | | | | | | | | | | | | | | | | | |
| flexible (third) workplace or comparable | | ✓ | ✓ | × | × | ✓ | × | × | ✓ | × | × | ✓ | × | × | × | × | ✓ | × | × | × | × |
| performance | | ✓ | × | × | × | × | ✓ | × | × | × | × | ✓ | × | × | × | × | × | × | × | × | × |
| motivation | | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × |
| other (in-) dependent variables | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| primary research | | × | × | ✓ | ✓ | ✓ | ✓ | × | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Action | | exclude | exclude | exclude | exclude | full text | exclude | exclude | full text | exclude | exclude | full text | exclude | exclude | exclude | exclude | full text | exclude | exclude | exclude | exclude |

| | Database | Emerald Management 200 | | | | | | | | | | | | | | | | | | | |
|--|----------|------------------------|---------|---------|-----------|---------|---------|-----------|-----------|-----------|-----------|---------|---------|---------|-----------|---------|---------|---------|-----------|---------|---------|
| | Number | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 |
| Criteria | | | | | | | | | | | | | | | | | | | | | |
| flexible (third) workplace or comparable | | x | x | x | ✓ | x | x | ✓ | ✓ | ✓ | ✓ | x | x | x | ✓ | x | x | x | ✓ | x | x |
| performance | | ✓ | x | x | ✓ | x | x | x | x | ✓ | x | ✓ | x | x | x | x | x | x | ✓ | x | x |
| motivation | | x | x | x | x | x | x | x | ✓ | x | x | x | x | x | x | x | x | x | x | x | x |
| other (in-) dependent variables | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| primary research | | ✓ | x | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | x | ✓ | ✓ | ✓ | ✓ | x | ✓ | ✓ | x | x |
| Action | | exclude | exclude | exclude | full text | exclude | exclude | full text | full text | full text | full text | exclude | exclude | exclude | full text | exclude | exclude | exclude | full text | exclude | exclude |

| Database | | Emerald Management 200 | | | | | | | | | | | | | | | | | | | |
|--|--------|------------------------|---------|-----------|---------|---------|---------|-----------|-----------|---------|---------|---------|---------|---------|---------|---------|-----------|---------|---------|---------|---------|
| Criteria | Number | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 |
| flexible (third) workplace or comparable | | ✓ | × | ✓ | × | × | × | ✓ | ✓ | × | × | ✓ | ✓ | × | × | × | ✓ | × | × | × | × |
| performance | | × | × | ✓ | ✓ | × | × | × | × | × | × | ✓ | × | ✓ | ✓ | × | × | × | × | × | ✓ |
| motivation | | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × |
| other (in-) dependent variables | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| primary research | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | × | ✓ | × | × | ✓ | ✓ | × | ✓ | × | ✓ | ✓ | ✓ |
| Action | | full text | exclude | full text | exclude | exclude | exclude | full text | full text | exclude | exclude | exclude | exclude | exclude | exclude | exclude | full text | exclude | exclude | exclude | exclude |

| Database | | SAGE journals | | | | | | | | | | | | | | | | | | Scopus | |
|--|--------|---------------|---------|---------|---------|---------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Criteria | Number | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 |
| flexible (third) workplace or comparable | | × | × | × | × | × | ✓ | ✓ | ✓ | ✓ | × | × | × | × | × | × | × | × | × | × | × |
| performance | | × | ✓ | ✓ | ✓ | ✓ | × | × | ✓ | ✓ | × | × | × | × | × | ✓ | × | × | ✓ | ✓ | ✓ |
| motivation | | × | × | × | × | × | × | × | ✓ | × | × | × | × | × | × | × | × | × | × | ✓ | ✓ |
| other (in-) dependent variables | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| primary research | | ✓ | × | × | × | ✓ | ✓ | × | × | × | × | ✓ | × | ✓ | ✓ | ✓ | ✓ | ✓ | × | × | ✓ |
| Action | | exclude | exclude | exclude | exclude | exclude | full text | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude | exclude |

| Database | | Snowball Technique | | | | | | | | | | | | | | | | | | | |
|--|--------|--------------------|-----------|---------|-----------|-----------|---------|---------|-----------|---------|---------|-----------|---------|---------|-----------|-----------|---------|---------|-----------|-----------|---------|
| Criteria | Number | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 |
| flexible (third) workplace or comparable | | ✓ | ✓ | × | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | × | ✓ | ✓ | × | ✓ | ✓ | × | × | ✓ | ✓ | ✓ |
| performance | | ✓ | × | × | × | × | × | × | × | × | × | ✓ | × | × | × | × | ✓ | × | ✓ | × | × |
| motivation | | × | × | × | ✓ | × | × | × | ✓ | × | × | × | × | × | × | × | × | × | × | × | × |
| other (in-) dependent variables | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| primary research | | ✓ | ✓ | ✓ | × | × | × | × | ✓ | × | × | ✓ | × | ✓ | ✓ | ✓ | × | ✓ | ✓ | ✓ | × |
| Action | | full text | full text | exclude | full text | full text | exclude | exclude | full text | exclude | exclude | full text | exclude | exclude | full text | full text | exclude | exclude | full text | full text | exclude |

| Database | | Snowball Technique | | | | | | | | | | | | | | | | | | | |
|--|--------|--------------------|-----------|---------|---------|-----------|---------|---------|---------|---------|-----------|---------|---------|---------|---------|-----------|-----------|---------|---------|---------|---------|
| Criteria | Number | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 | 240 |
| flexible (third) workplace or comparable | | ✓ | ✓ | × | × | ✓ | × | ✓ | × | ✓ | ✓ | ✓ | × | ✓ | ✓ | ✓ | ✓ | × | ✓ | × | ✓ |
| performance | | × | × | ✓ | ✓ | × | × | × | × | × | ✓ | ✓ | × | × | × | × | × | ✓ | × | × | × |
| motivation | | × | × | × | × | × | × | × | ✓ | × | × | ✓ | × | × | × | × | × | × | × | × | × |
| other (in-) dependent variables | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| primary research | | ✓ | ✓ | ✓ | × | ✓ | ✓ | × | ✓ | × | ✓ | × | n.a. | × | × | ✓ | ✓ | ✓ | × | ✓ | × |
| Action | | full text | full text | exclude | exclude | full text | exclude | exclude | exclude | exclude | full text | exclude | exclude | exclude | exclude | full text | full text | exclude | exclude | exclude | exclude |

| | Database | Snowball Technique | | | | | | | | | | | | | | | | | | | |
|--|----------|--------------------|-----------|---------|-----------|-----------|-----------|---------|---------|---------|---------|---------|-----------|---------|-----------|---------|-----------|-----------|---------|-----------|-----------|
| | Number | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | 257 | 258 | 259 | 260 |
| Criteria | | | | | | | | | | | | | | | | | | | | | |
| flexible (third) workplace or comparable | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| performance | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| motivation | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | ✓ |
| other (in-) dependent variables | | ✓ | ✓ | x | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| primary research | | ✓ | ✓ | x | ✓ | ✓ | ✓ | x | x | x | x | x | ✓ | x | ✓ | x | ✓ | ✓ | x | ✓ | ✓ |
| Action | | full text | full text | exclude | full text | full text | full text | exclude | exclude | exclude | exclude | exclude | full text | exclude | full text | exclude | full text | full text | exclude | full text | full text |

| Criteria | Database | Snowball Technique | | | | | | | | | | | | | | | | | | | |
|--|----------|--------------------|-----------|-----------|-----------|-----------|---------|-----------|---------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Number | 261 | 262 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 | 271 | 272 | 273 | 274 | 275 | 276 | 277 | 278 | 279 | 280 |
| flexible (third) workplace or comparable | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| performance | | × | × | ✓ | ✓ | × | × | ✓ | ✓ | ✓ | × | ✓ | × | × | × | × | ✓ | × | × | × | ✓ |
| motivation | | × | × | × | × | × | × | × | ✓ | × | × | × | × | × | × | × | × | × | × | × | × |
| other (in-) dependent variables | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| primary research | | ✓ | ✓ | ✓ | ✓ | ✓ | × | ✓ | × | × | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Action | | full text | full text | full text | full text | full text | exclude | full text | exclude | exclude | full text | full text | full text | full text | full text | full text | full text | full text | full text | full text | full text |

| | Database | Snowball Technique | | | | | | | | | | | | | | | | | | | |
|--|----------|--------------------|-----------|-----------|-----------|-----------|---------|---------|-----------|---------|-----------|---------|---------|---------|-----------|-----------|---------|---------|-----------|---------|---------|
| | Number | 281 | 282 | 283 | 284 | 285 | 286 | 287 | 288 | 289 | 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 | 298 | 299 | 300 |
| Criteria | | | | | | | | | | | | | | | | | | | | | |
| flexible (third) workplace or comparable | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ |
| performance | | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ | ✓ |
| motivation | | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ |
| other (in-) dependent variables | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| primary research | | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ | ✗ |
| Action | | full text | full text | full text | full text | full text | exclude | exclude | full text | exclude | full text | exclude | exclude | exclude | full text | full text | exclude | exclude | full text | exclude | exclude |

| | Database | Snowball Technique | | | | | | | | | | | | | | | | |
|--|----------|--------------------|---------|---------|---------|-----------|---------|---------|-----------|---------|---------|-----------|-----------|---------|-----------|-----------|-----------|-----------|
| | Number | 301 | 302 | 303 | 304 | 305 | 306 | 307 | 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 |
| Criteria | | | | | | | | | | | | | | | | | | |
| flexible (third) workplace or comparable | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| performance | | x | x | ✓ | ✓ | x | x | x | ✓ | x | x | x | x | x | ✓ | x | x | x |
| motivation | | x | x | x | x | x | x | ✓ | x | x | x | x | x | x | x | x | x | x |
| other (in-) dependent variables | | ✓ | ✓ | ✓ | ✓ | x | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| primary research | | ✓ | x | x | x | ✓ | x | x | ✓ | x | x | ✓ | ✓ | x | ✓ | ✓ | ✓ | ✓ |
| Action | | full text | exclude | exclude | exclude | full text | exclude | exclude | full text | exclude | exclude | full text | full text | exclude | full text | full text | full text | full text |

Appendix II: Systematic literature review: Summary of results presented as a table

| Descriptive analysis | | | | | | | Thematic analysis | | | |
|---|---|--|---------------------|-------------|-------------|--------------|-------------------|--|--|--|
| Title | Author/s | Publication details | Year of publication | VHB ranking | ABS ranking | ABDC ranking | Approach | Context/population | Sample | Key results |
| Workplace flexibility and innovation. The moderator effect of inter-organizational cooperation | Martínez-Sánchez, A., Vela-Jiménez, M.J., Pérez-Pérez, M. and de Luis-Carrión, P. | Personnel Review, Vol. 37, No. 6, pp. 647-665 | 2008 | no ranking | 2 | A | deductive | 156 Spanish companies, CEOs and HR managers | 97 first-tier suppliers and 59 telecommunications companies | <ul style="list-style-type: none"> functional flexibility correlates positively with company innovation (0.433** total sample; 0.522*** manufacturing firms; 0.873*** service firms) and is moderated positively by inter-organizational cooperation (0.543**; 0.489**; 0.321***) |
| Leader framing and follower sense-making: Response to downsizing in the brave new workplace | Bean, C.J. and Hamilton, F.E. | Human Relations, Vol. 59, No. 3, pp. 321-349 | 2006 | B | 4 | A* | inductive | Telenor, Norwegian telecommunications group | 40 (former) employees, three key informants from different divisions, three special informants | <ul style="list-style-type: none"> flexible work desirable for the employees and the company (during the process of becoming a learning organization) flexibility regarding changing demands (modification of work habits) communication technology and mobile computing as anchors to the company leaders frame flexible work some employees are challenged due to flexible work, others accept it |
| Workplace flexibility and new product development performance: The role of telework and flexible work schedules | Coenen, M. and Kok, R.A.W. | European Management Journal, Vol. 32, No. 4, pp. 564-576 | 2014 | B | 2 | B | inductive | Two companies with more than 1,000 employees and 100 million dollars turnover from the telecommunications sector | seven interviews (one consultant and six project leaders) | <ul style="list-style-type: none"> telework usage leads to more virtual contact (email, chat, telephone, exchanging presentations, document storage) hot desking and flexible work schedule usage increase telework usage more virtual contact leads to more cross-functional cooperation (moderated by disbalance between virtual and face-to-face contact) more telework usage leads to more inter-organizational involvement (moderated by disbalance between virtual and face-to-face contact) more telework usage leads to less shared knowledge quality (moderated by knowledge sickness) |

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|---|---------------|--|------|-----------------------|---|---|-------------------------|---|--|---|
| Mobile email as a business and personal performance driver in everyday knowledge work - A multi-method case study | Franssila, H. | Knowledge and Process Management, Vol. 20, No. 4, pp. 185-198 | 2013 | not listed in ranking | 1 | B | inductive and deductive | Finnish multinational ICT enterprise, division: sales and other consumer interface positions, management, product development | six qualitative interviews, diary studies (distribution, used tools/applications, content/goals of communication), survey questionnaire (web-based, n = 195) | <ul style="list-style-type: none"> • internal (colleagues/employees) and external (clients/business partners) communication, administrative tasks and personal issues via mobile email (multipurpose communication application) • managers (56 %) use mobile email more than employees (task-technology fit important) • statistical findings: intensive mobile email usage leads to (1) higher work satisfaction ($p = 0.011^{**}$), (2) improved productivity ($p = 0.007^{**}$), (3) increased work output ($p = 0.002^{**}$), (4) faster decision making ($p = 0.021^{*}$), (5) more free time ($p = 0.006^{*}$), (6) more work related stress ($p = 0.005^{**}$) • statistically indicative findings: work more fluent/efficient, avoidance of excessive traveling, foresighting and planning of work tasks became easier, improved time management • more intensive users of mobile email were traveling at least 16 hours per week instead of less ($p = 0.030$) |
| The constitution of 'third workspaces' in between the home and the corporate office | Kingma, S.F. | New Technology, Work and Employment, Vol. 31, No. 2, pp. 176-193 | 2016 | not listed in ranking | 3 | A | inductive | two companies which provide flexible workspaces, two case studies with informal discussions, talks and formal interviews, website, documents, advertising was studied | case study one: n = 21 employees, case study two: n = 25 employees | <ul style="list-style-type: none"> • third workspace is away from company (although possible to work there) and home office and therefore a spatial innovation; people are connected due to virtual networks what leads to alternative settings regarding work; only possible because of digital network/internet connection and digital devices (laptops and mobile phones are used everywhere); being in between the virtual and material office as well as in between the corporate and home office; third workspace (lived space) can be understood as an exception (without) or standard (with work performance moderation); permanent presence in virtual and physical environment due to the expectation of always being available • embedding of virtual work in physical environments (face-to-face as well as workspace contact) • work activities relate to different workspaces (shape and content of workspace are clearly separated), people behave differently in various locations depending on the customs there • work and private life are sometimes differentiated, at other times the difference is blurred, maintaining the home borderline/privacy protection (push factor) gets important, but also sharing |

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| | | | | | | | | | <p>work experiences and socializing (pull factor) in the third workspace; space is a concern which is counterbalanced by the application of mobile devices</p> <ul style="list-style-type: none">• clients are met in representational surroundings on a territory that is neutral and positively related to the image• there is a difference between working flexibly and third workspaces, because third workspaces create a social imagery, third workspaces can be corporate or private spaces (if thinking in extremes)• unflexible opening hours of the company could impede the work experience and work flow, just one example of increased networking/co-working identified• hybrid work sittings may evolve because there is no implicit end of working time in home/corporate offices due to third workspaces; such usage can range from a couple of hours up to a whole week | |
| Managerial perceptions of workplace flexibility and firm performance | Martínez-Sánchez, A., Vela-Jiménez, M.J., de Luis-Carrión, P. and Pérez-Pérez, M. | International Journal of Operations & Production Management, Vol. 27, No. 7, pp. 714-734 | 2007 | B | 4 | A | deductive | 156 Spanish companies | 97 first-tier supplier (automotive) and 59 service companies (telecommunication, consulting and software) | <ul style="list-style-type: none">• internal flexibility (functional as well as numerical) is positively related to firm performance• external numerical flexibility is negatively related to financial firm performance (-0.131) but positively to firm performance innovation (0.032)• higher access to functional flexibility practices by employees in high-outsourcing companies than in low-outsourcing companies ($p < 0.1$)• companies that source out more peripheral activities (in contrast to outsourcing companies of near-core activities) use external numerical flexibility more often• the more functional flexibility or internal numerical flexibility is used, the more the firm performance increases |

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|--|--|--|------|-----------------------|-----------------------|---|-----------|--|--|---|
| Workplace flexibility and communication flows: A structural view | Nordbäck, E.S., Myers, K.K. and McPhee, R.D. | Journal of Applied Communication Research, Vol. 45, No. 4, pp. 397-412 | 2017 | not listed in ranking | not listed in ranking | B | inductive | Two Finnish companies (one telecommunication and one transportation company) | 53 semi-structured interviews with knowledge workers were conducted (26 in the telecommunication and 27 in the transportation company) | <ul style="list-style-type: none"> • One supportive company: <ul style="list-style-type: none"> - work is built on trust, supervisors support flexible work, relaxed home-work boundaries - work-life balance can be constrained if the employees are too ambitious - if company allows flexible work, but supervisors do not, employees use their power to use the flexibility and to demonstrate it to the supervisors - there is active coordination and employees take care of the needs of their co-workers (informing each other about space-time constraints), their schedule, task demands as well as personal preferences and responsibilities - individual needs stand behind the needs of the company/the job - organizational membership and work are not limited to the office (different locations and time shifts are allowed), although it is easier to build up/develop relationships in the office - co-worker support is important - if they use flexwork successfully, the other employees increase the usage of flexwork as well - flexwork is important for membership, which includes performance, work-life balance and well-being • One non-supportive company: <ul style="list-style-type: none"> - extensive negotiations needed for flexwork - personal needs of employees are more in the background than the rules; some tried to negotiate but failed, so employees eventually agreed to the rules - flexwork does not seem to be a viable option - being in the office is equated with organizational membership - non-supportive management leads to feeling constrained, permission to work remotely (if there is a need to do so) is proof of trust - some employees prefer just to work in the office so that they do not need to be available all day long (employees distrust employers who may take advantage of their being available all the time) • if work and private life mix too much, there can be stress on the part of the employees which can lead to fluctuation and burnout |
|--|--|--|------|-----------------------|-----------------------|---|-----------|--|--|---|

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| An exploration of the emotional impact of teleworking via computer-mediated communication | Mann, S., Varey, R. and Button, W. | Journal of Managerial Psychology, Vol. 15, No. 7, pp. 668-690 | 2000 | B | 3 | C | inductive | pilot study in the UK, where two companies - one in the banking and one in the telecommunications sector - were analyzed | 14 semi-structured interviews with employees in non-managerial positions in telework, all were office-based before | <ul style="list-style-type: none"> • there are advantages and disadvantages to teleworking: <ul style="list-style-type: none"> - advantages: less traveling (57%), more flexibility/freedom (57%), better work environment (being sick less often) (50%), fewer distractions (43%), lower costs (emotional impact: more money available for relaxation activities and less worries about financial concerns, due to less travelling) (29%), freedom in the choice of comfortable clothing (14%) and of office policies (7%), easier to do householding (7%) - disadvantages: being isolated (not good for teamwork/projects) (57%), longer working hours (not being able to switch off, leads to lower satisfaction) (50%), not enough support (28%), lower sick leave (work although employees are ill) (21%), career development (14%), costs (lighting, heating etc.) (7%) |
| Teleworking and workplace flexibility: A study of impact on firm performance | Martínez Sánchez, A., Pérez Pérez, M., de Luis Carnicer, L. and Vela Jiménez, M.J. | Personnel Review, Vol. 36, No. 1, pp. 42-64 | 2007 | no ranking | 2 | A | deductive | small and medium sized companies from Galicia (Spain), structured questionnaire filled in during the interviews | n = 479 companies, n = 9,873 company managers | <ul style="list-style-type: none"> • one type of teleworking is used by 75.5% and two types are used by 16.9% of the sample; types: mobile telework (83.0%), home-based telework (35.8%), urban telecenters (9.4%), rural telecenters (5.7%) • 11.1% of the sample have adopted teleworking (53 companies), 1.8% are teleworkers (average in EU 6% and US 20%) • relationships found: telework adoption is positively related to flexitime ($p < 0.01$); involvement in planning and job design of employees in telework-adopting companies is higher than in non-adopting companies ($p < 0.05$); telework is positively related to management by objectives and performance ($p < 0.05$); variable compensation (financial flexibility) is higher in telework-adopting companies ($p < 0.05$); teleworking companies are more decentralized due to business units and production plants ($p < 0.1$) as well as a geographically wideness of the market ($p < 0.01$) • no relationship between: temporary versus contingent work and telework adopting; outsourcing and telework; job involvement and flexible monitoring systems to firm performance • significant impact of spatial decentralization and temporary work on firm performance; firm performance is positively related to telework; |

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| | | | | | | | | | | company size is irrelevant • spatial decentralization is positively related to telework adoption and firm performance |
| Home-based teleworking and the employment relationships. Managerial challenges and dilemmas | Harris, L. | Personnel Review, Vol. 32, No. 4, pp. 422-437 | 2003 | no ranking | 2 | A | deductive | sales team at a company that produces drinks; company survey was employed (six months after the start of telework) | n = 41 employees and line managers | • telework leads to a redefinition of spatial and temporal boundaries, domain between work and home becomes blurred • isolation: 63% of employees felt forgotten, turnover increased up to 20% per year (from 6%), high performing and more experienced employees left the company, less face-to-face communication leads to longer durations of problem solving, only 15% have regular social contacts, socialization very important (90%), not enough contact to line managers (feel invisible, time spent for the company is not valued) • productivity: more time was spent in the home office (76%), although productivity only felt increased by 44% (more interruptions/distractions at home), working on the weekend to catch up with workload, 56% allowed customers to call all day long (24 hours) • problems if both partners work from home/one is a non-working person/very young children are at home - may lead to stress-related illness, some arrange time slots for family and work • commitment declines due to high commitment theory (80%) • workplace: 50% have a place just for working, 30% work at the kitchen table • increasing costs for employees (lighting, heating) remunerated with 500 Pounds at the end of the year for furniture, etc. (neglect of duty of care) • trust is eroded due to temporal flexibility |

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| | | | | | | | | | | <ul style="list-style-type: none"> • stress related to the occupation is more often recognized among remote employees |
| The organizational implications of human resources managers' perception of teleworking | Pérez Pérez, M., Martínez Sánchez, A. and de Luis Carnicer, M.P. | Personnel Review, Vol. 32, No. 6, pp. 733-755 | 2003 | no ranking | 2 | A | deductive | Spanish companies with more than 25 employees, conducted in 2000 (second half), average company size = 181 employees; average age = 28; average tenure = 10.5 years | n = 157 (response rate 21 %) | <ul style="list-style-type: none"> • benefits of telework for employees (working time flexibility, less travelling to work, autonomy, worklife is easier) and for the company (increase in productivity, reduction of fixed costs, more flexible work organization) • challenge while telework is in use: performance control of employees • important variables for HR managers regarding feasibility of telework: tasks need to be suitable, involvement of employees to program and design their tasks, percentage of sales employees within the workforce, usage of information and communication technologies, innovativeness of a company/culture for fostering and stimulating changes, combining/sharing several work locations • unimportant variables for HR managers regarding feasibility of telework: gender, compensation and training of employees • HR managers in small firms see more opportunities for teleworking than HR managers in large firms |
| From anxiety to assurance: Concerns and outcomes of telework | Maruyama, T. and Tietze, S. | Personnel Review, Vol. 41, No. 4, pp. 450-469 | 2012 | no ranking | 2 | A | deductive | employees who work as teleworkers for under 12 months at British Telecommunications PLC | n = 394 | <ul style="list-style-type: none"> • positive aspects of telework (more workspace control (80.8%), greater autonomy (58.8%), more workload done (86.2%), reduced stress related travelling (81.8%), increased flexibility (82.0%)) • concerns about telework (loss of professional (24.2%) and social (32.7%) interaction, less career development and visibility (12.3%)) • male employees report more family conflicts, women (especially with children) report greater ability to manage childcare and work, which is a major motivation for teleworking • socio-demographic variables or job type are not |

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| | | | | | | | | | | <ul style="list-style-type: none"> relevant regarding the perceived productivity • reduced career development and visibility is related to gender and the presence of children (most importantly for women with children), also important for marketing and sales employees (1.8 times more often reported than employees from other fields) - use HR and performance management system to ensure that performance is relevant for promotion, not visibility • greater perceived productivity due to telework • chance for employers to recruit and retain (talented) employees and to create an open culture |
| Why the availability of telecommuting matters. The effects of telecommuting on engagement via goal pursuit | Masuda, A.D., Holt-schlag, C. and Nicklin, J.M. | Career Development International, Vol. 22, No. 2, pp- 200-219 | 2017 | not listed in ranking | 2 | B | deductive | longitudinal study design, three phases of measurement, business school alumni in Spain | n = 353 (first phase, 35 % response rate), n = 294 (second and third phase, 63 and 71 % response rate) | <ul style="list-style-type: none"> • telecommuting availability is positively related to noticed supervisor target support ($B = 0.80$, $p = 0.02$) and to degree of commitment at the end of the working year ($B = 0.54$, $p < 0.01$), noticed supervisor target support is positively related to target progress ($B = 0.36$, $p = 0.001$), which is positively related to degree of commitment at the end of the working year ($B = 0.27$, $p < 0.001$) • If the level of attaining goals is low, there is a decrease of engagement in the time period. If the level of attaining goals is high, there is no significant change over the year. • engagement of employees is predicted by telecommuting, they are more engaged at the end of the year • support as a job resource predicts engagement |
| Labour flexibility in SMEs: The impact of leadership | Mesu, J., Van Riemsdijk, M. and Sanders, K. | Employee Relations, Vol. 35, No. 2, pp. 120-138 | 2013 | B | 2 | B | deductive | SMEs in The Netherlands, health- and childcare, ICT business, pubs, high-tech enterprises, restaurants and agricultural firms (31 non-manufacturing and 19 | 755 employees | <ul style="list-style-type: none"> • overall low usage of temporal and functional flexibility • younger and male employees use functional flexibility the most • development stimulation, visionary leadership, management by exception active and contingent reward are related positively to temporal flexibility (not to functional flexibility), management by exception passive positively related to functional and temporal flexibility • commitment and temporal flexibility are positively related (0.082^*, 95% confidence level) • relationship between temporal flexibility and visionary leadership mediated partially by affective commitment, full mediation of relationship between contingent reward/development stimulation and temporal flexibility by affective |

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| | | | | | | | | manufacturing firms) | | <p>commitment, partial mediation of the relationship between temporal flexibility and management by exception active by affective organizational commitment, no mediation effect by affective commitment on the relationship between functional flexibility and leadership behavior</p> <ul style="list-style-type: none"> • temporal flexibility (in-) directly increased by effective leadership because affective organization commitment is positively influenced • functional and temporal flexibility are directly affected by management by exception passive (extra hours and non-standard tasks are done by employees because of bad supervisors' management, employees seem to be obliged to do so, no sign of commitment, may have negative influences in the long run for employees and employers) • rely on effective leadership (not ineffective) in future, if labor flexibility tends to be beneficial for all parties involved |
| Telework adoption, change management, and firm performance | Martínez-Sánchez, A., Pérez-Pérez, M., Vela-Jiménez, M.J. and de-Luis-Carnicer, P. | Journal of Organizational Change Management, Vol. 21, No. 1, pp. 7-31 | 2008 | no ranking | 2 | B | deductive | HR managers and CEOs of 97 industrial companies and 59 service companies in Spain, response rate = 26.3 % | 156 companies | <ul style="list-style-type: none"> • social benefits (HR) (0.347**), core staff (0.191*), turnover (0.314**), commitment practices (0.240**) and functional flexibility (0.267**) are positively related to telework ($R^2 = 0.388$), which is related to firm performance (0.284**) as well as functional flexibility (0.240*), internal numerical flexibility (0.158*) and external numerical flexibility (-0.167*) • telework (+), external flexibility (-), internal numerical flexibility (+) and functional flexibility (+) are related significantly to financial, innovation and relation performance • the intensity of use of telework is increased by social environments which have created great confidence in their supervisors and employees • an environment has to be created that leads to a beneficial productivity of employees who are able to organize themselves, employee involvement and skill development practices are needed |

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| Flexible work: Ambitious parents' recipe for career success in The Netherlands | Dijkers, J., van Engen, M. and Vinckenburg, C. | Career Development International, Vol. 15, No. 6, pp. 562-582 | 2010 | not listed in ranking | 2 | B | deductive | companies from a variety of 13 branches in The Netherlands | n = 212 parents | <ul style="list-style-type: none"> • education ($b = 0.31^{***}$) as well as gender ($b = -0.60^{***}$) are related to work hours, mothers work less hours per week than fathers, but the increase in ambitious mothers' working hours is stronger than the increase in the fathers' working hours, when they are ambitious • parents who are ambitious work longer weekly hours than parents that are less ambitious, parents with longer working hours or who use (a lot of) flexible work home arrangements have a higher level of employment than parents that work fewer hours per week or use less flexible work home arrangements • relationship between gender and ambition ($b = 0.11^{**}$) • more ambitious ($b = 0.45^{***}$) and higher educated parents ($b = 0.45^{***}$) more often use flexible work home arrangements • relationship between usage of flexible arrangements and ambition is positive and associated more strongly with women • education ($b = 0.24^{***}$), gender ($b = -0.32^{***}$), ambition ($b = 0.27^{***}$), usage of flexible work home arrangements ($b = 0.15^{**}$) and number of work hours ($b = 0.44^{***}$) are related to job level; relationship between job level and ambition is mediated by working hours and usage of flexible work-home arrangements of working parents (full mediation) • education ($b = 0.19^{**}$), ambition ($b = 0.16$), usage of flexible work-home arrangements ($b = 0.10$, not significant) as well as work hours ($b = 0.23^{**}$) are related to career satisfaction; relationship between career satisfaction and ambition is fully mediated by working hours of the parents |
| Why teleworkers are more satisfied with their jobs than office-based workers: when less contact is beneficial | Fonner, K.L. and Roloff, M.E. | Journal of Applied Communication Research, Vol. 38, No. 4, pp. 336-361 | 2010 | not listed in ranking | not listed in ranking | B | deductive | teleworkers and office-workers in different types of organizations and different job positions | 89 teleworkers / 103 office-workers | <ul style="list-style-type: none"> • telework is significantly related to job satisfaction ($p = 0.19$ $p < 0.001$) • indirect path from telework to work-life conflict ($p = -0.15$) and then to job satisfaction ($p = -0.23$) was significant ($p = 0.05$) • indirect path from telework to frequency of information exchange ($p = -0.32$), then to stress due to interruptions ($p = 0.39$), then to work-life conflict ($p = 0.40$) and then to job satisfaction ($p = -0.023$) was significant ($p < 0.05$) |

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| | | | | | | | | | | <ul style="list-style-type: none"> indirect path from telework to perceived general policy ($p = -0.15$) to perceived get ahead policies ($p = -0.64$) to job satisfaction ($p = -0.51$) is significant ($p < 0.05$) |
| Telecommuting, professional isolation, and employee development in public and private organizations | Cooper, C.D. and Kurland, N.B. | Journal of Organizational Behavior, Vol. 23, No. 4, pp. 511-532 | 2002 | A | 4 | A* | inductive | semi-structured interviews in private (supervisors (17), telecommuters (24), non-telecommuters (12)) and public sector (supervisors (13), telecommuters (13), non-telecommuters (13)) | n = 93 | <ul style="list-style-type: none"> both private and public employees recognize that professional isolation is inseparably associated to development of employees, especially the <ul style="list-style-type: none"> interpersonal networking (grapevine and interpersonal networks seem to be less important in promoting staff development and organizational effectiveness in public than in private sector enterprises) informal learning (private sector workers rated informal learning higher and perceived telework as a negative impact on informal learning rather than in the public sector) mentoring (seems to be challenging due to the absence of teleworkers and therefore due to less mentoring, some established communication channels or the submission of an agenda before teleworking to enable some mentoring) no relationship was found between professional isolation and teleworking frequency was found, teleworkers are afraid of isolation, so they do less teleworking and doing less teleworking leads to less isolation |
| To infinity and beyond?: Workspace and the multi-location worker | Hislop, D. and Axtell, C. | New Technology, Work and Employment, Vol. 24, No. 1, pp. 60-75 | 2009 | not listed in ranking | 3 | A | inductive | knowledge-workers from two small UK management consulting companies (six senior consultants/founder, ten consultants, two graduate trainees) | n = 18 interviews | <ul style="list-style-type: none"> four major locations identified for (remote) working: <ul style="list-style-type: none"> journeys by car which are work-related: communication via mobile phone (formal calls with clients and colleagues as well as informal social calls with colleagues), driving is stressful and less productive offices of clients: attention is given to the clients and their social norms (no usage of mobile phones, mostly formal communication), working with clients (presenting solutions, pitching, etc.) home office: undisturbed work area, less contact to others (although possible) in favor of working effectively concentrated on difficult tasks office at the company: employees tried to be there a minimum of once a week, Friday is |

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| | | | | | | | | | <p>meeting day, formal and informal interactions as well as group-based and co-working tasks with colleagues, not a good place for working concentrated and quietly</p> <ul style="list-style-type: none"> • the workplace of workers with several locations is much more diverse and also much more volatile • multi-location workers typically have to spend more energy on the creation and production of a workplace in the places where their work takes them than office workers, as such locations are often difficult to manage • the workplace, instead of being a stable, static, constant place, turns into any space they can utilize or manipulate for working needs, but on a temporary basis • the employee only has a limited amount of control of the workplace, because other people may also use it (like hotel lobbies for instance) |
| Home teleworking: A study of its pioneers | Pratt, J.H. | Technological Forecasting and Social Change, Vol. 25, No. 1, pp. 1-14 | 1984 | B | 3 | A | inductive | interview partners were gathered from articles about working at home, employees and employers were contacted, interviews were conducted with people from 36 different companies and 14 different industries | <p>n = 46 employees working in a home office n = 15 employees</p> <ul style="list-style-type: none"> • home workers are self-disciplined, have skills that are leverageable and do not need the company's office for getting into social contact, home workers get a lot of freedom (time to work defined by worker) • the equipment is owned by the employer (over 57 %), the same equipment as employees that work in the company's office • cost savings for employees due to less traveling, clothes, parking fees, childcare, etc., but also cost increase (heating, lighting), possibility to work for companies in other cities • productivity seems to increase (67%) due to working at home, productivity is measured by supervisors (reports, hours worked, tasks completed, piecework standard (no income guaranteed for employees); sometimes more feedback is desirable for employees, home office work for tasks that need a lot of concentration without interruptions or for catching up, some employees report that more interesting and complex tasks require them to be present in the office • employees sometimes missed intellectual and social contact when working at home, but they also like not being interrupted (like in the company office), the informal contact is missing as |

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| | | | | | | | | | | <p>well</p> <ul style="list-style-type: none"> • working in the home office does not advance their career, employees that are focused on a career go back to the office as soon as possible • benefits for employers: reaching new candidates (recruitment), productivity may increase, good for the environment (less pollution and use of energy), lower costs for stations to work in, jobs can be created for people who want to retire or are handicapped, easy implementation, some training was offered |
| Telework: What does it mean for management? | Illegems, V. and Verbeke, A. | Long Range Planning, Vol. 37, No. 4, 319-334 | 2004 | B | 3 | A | deductive | two surveys were conducted in different companies and non-profit/government organizations in Brussels | n = 83 managers n = 261 employees | <ul style="list-style-type: none"> • (non-) adopters of teleworking mostly have the same business-related perceptions concerning the positive impacts of teleworking • benefits ((+) and detrimental (-) of the adopters' view: retaining employees (+), absenteeism (+), flexibility (+), productivity (+), functionality in the tightest of spaces (+), office space (+), disabled people get job opportunities (+), organizations' image (+), ICT investments (-), tasks that require teamwork as well as face-to-face contact (-), securing in-house data (-), labor laws (-) • benefits ((+) and detrimental (-) of the non-adopters' view: absenteeism (+), flexibility (+), productivity (+), functionality in the tightest of spaces (+), office space (+), disabled people get job opportunities (+), social isolation (-), tasks that require teamwork as well as face-to-face contact (-), securing inhouse data (-), culture of the organization (-) • teleworkers seem to be satisfied and involved, because they do not report social isolation, fewer possibilities of getting promoted, issues with the direct superior or with the equipment • telework can be used as an HRM practice of strategical importance in the long run which contributes to the resource base of human capital, the (performance) measurement is important • because there are workers who mainly see the disadvantages, telework cannot simply be utilized as a motivating instrument in general |

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| The organizational context of teleworking implementation | Illegems, V., Verbeke, A. and S'Jegers, R. | Technological Forecasting and Social Change, Vol. 68, No. 3, pp. 275-291 | 2001 | B | 3 | A | deductive | HR managers from 230 Brussels-based companies | n = 83 managers | <ul style="list-style-type: none"> • telework is mainly considered to be a part-time option, it will only be implemented if the advantages compensate the disadvantages • HR managers of companies that did (not) implement teleworking agreed on the following advantages of teleworking: higher flexibility and productivity, qualified employees can be retained in the company, less absenteeism, increased recruitment opportunities, lower employee turnover, solving the problem of insufficient office capacity, growth in office areas, more positive company image (higher flexibility and productivity, qualified employees can be retained in the company, were rated more positively by HR managers of companies that implement teleworking) • HR managers of companies that implement teleworking identified the following disadvantages: less face-to-face interaction and teamwork, internal data is less secure, hinders the compliance with health care rules, expansive investments necessary • HR managers of companies which have not implemented teleworking recognized the following disadvantages: fewer possibilities to promote employees, negative impact on the environment of the business, fewer loyal workers, trade union opposition, less face-to-face interaction and teamwork, internal data is less secure, hinders compliance with health care rules, labor law is unclear • five barriers on company level were identified: teleworking concept is not known, controlling through direct supervision, flow of sequential information, local commuting, few indefinite employment contracts • ten drivers for implementing teleworking were identified: company employees working in a sector which is knowledge-based, the area where the company is located is congested, a lot of communication is done electronically, monitoring system is focused on the output, decision making is a non-routine procedure, an organization that prefers team building, experience in outsourcing as well as the utilization of flexible working hours, a lot of employees, a lot of employees with a high level of education and a lot of white collar workers |
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| Technology enabled work: The role of self-efficacy in determining telecommuter adjustment and structuring behavior | Raghuram, S., Wiesenfeld, B. and Garud, R. | Journal of Vocational Behavior, Vol. 63, No. 2, pp. 180-198 | 2003 | B | 4 | A* | deductive | American telecommunications company which offers a teleworking program, employees with different jobs (e. g. engineers, managers, specialists) were interviewed | n = 723 employees that work at the home office at least half a day in a week | <ul style="list-style-type: none"> the self-efficacy of a telecommuter is correlated with the telecommuter adjustment ($r = 0.30$, $p < 0.01$) as well as with the structuring behavior ($r = 0.34$, $p < 0.01$), gender is also correlated with telecommuter adjustment ($r = 0.09$, $p < 0.05$), which describes that females have an adjustment that is higher the scope of telework moderates the relation between self-efficacy of telecommuters and the telecommuter adjustment (self-efficacy gets stronger if the amount of telework increases) the scope of telework moderates the relation between self-efficacy of telecommuters and the structuring behavior (self-efficacy gets stronger if the amount of telework increases) self-efficacy is important for teleworkers, especially regarding the outcomes and behaviors |
| Teleworking: benefits and pitfalls as perceived by professionals and managers | Baruch, Y. | New Technology, Work and Employment, Vol. 15, No. 1, pp. 34-49 | 2000 | not listed in ranking | 3 | A | inductive | five companies in the UK (one accountancy, two insurance, one local government and British Telecom), average tenure of teleworking 2.8 years, high education, different jobs/job levels, semi-structured interviews | sn = 62 teleworkers | <ul style="list-style-type: none"> due to telework, more time was spent with working, there was less travelling telework seems to increase effectiveness (42% felt it was getting better, 34% much better) because of less distractions and a stronger focus on the work to fulfill aims is correlated positively with better relationships in the family which leads to less stress related to work, but higher amounts of stress related to the family the correlation between performance appraisal as well as perceived effectiveness is negative, but not significant seeking for other jobs was correlated with job and organizational satisfaction, older employees (age: $r = 0.32$, $p < 0.05$) would like to leave more often, as would men (gender: $r = 0.35$, $p < 0.01$) stress occurred due to overload, time scales that were tight and when deadlines were coming close, a separate room is the best for balancing work at home, most of the teleworkers are at home and in the office two or three days respectively, just a few would like to be full-time teleworkers co-workers reacted by being jealousy or suspicion (or both), a specific culture is needed in a company that allows telework most teleworkers felt healthier (no travelling, |

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| | | | | | | | | | | <p>less stress), some missed the bodily activity</p> <ul style="list-style-type: none"> • individual qualities for being a teleworker: self-discipline and motivation, being able to work on their own, persistence, being organized and self-confident, having good time management, ability to work with a computer, being integer and having good communication skills • if people need a social life or to be supervised, they are unfit for teleworking • telework is only possible if the job does not require physical presence, so the job can be done with technology |
| When "work" comes "home": Coping strategies of teleworkers and their families | Tietze, S. | Journal of Business Ethics, Vol. 41, No. 4, pp. 385-396 | 2002 | B | 3 | A | inductive | three case studies derived from semi-structured interviews with employees of different functional, industrial and sectoral backgrounds | n = 25 teleworkers | <ul style="list-style-type: none"> • different strategies for managing work and family at home (integration or segmentation, requiring artefacts and strong boundaries), interruptions (children, neighbors) are possible, although the women (men are breadwinners) take over the gatekeeper function • family/social interactions can become more important than the job, some feel lonely (and bored), new understanding of family members and workers is needed • danger of having to be reachable at all times (at work and at home) • inefficiency resulting from performing all day long in different roles at the same time needs to be eliminated • working at home can limit promotion in favor of being there for the family • teleworking can not be easily described with its consequences concerning decision-making in a moral or practical way (family versus work), therefore every worker/family needs to find its own way to deal with these issues |

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| Manager control and employee isolation in telecommuting environments | Kurland, N.B. and Cooper, C.D. | Journal of High Technology Management Research, Vol. 13, No. 1, pp. 107-126 | 2002 | no ranking | 2 | C | inductive | two companies were analyzed through informal conversations with directors, visits to the company and semi-structured interviews with employees and managers (17 supervisors, 24 telecommuters, 12 non-telecommuters) | n = 54 interviews | <ul style="list-style-type: none"> managers use clan, output and behavior strategies in controlling behavior of (non-) telecommuters for controlling behavior through face-to-face interaction, observation, audio conference meetings, supervision, informal conversation/actions, formalized jobs and tasks that were defined controlling the output via rewards that are performance-linked, management by objectives or by controlling the actions that are done online or by utilization of the computer (employees do not know about the latter two ways) controlling the clan via electing specific employees who are allowed to telework (independent work possible, experienced, mature, trustworthy, without a need for face-to-face communication), sometimes training is provided concerns regarding the professional isolation of teleworkers increase if the output is not measurable, therefore the management should not be reduced to managing results; development as well as career advancement should also be a concern of managers telecommuting challenges regarding the clan: <ul style="list-style-type: none"> team synergy: can be developed through trust and shared values which are a result of cohesion and (face-to-face) communication interactive informal learning: diminished due to teleworking, because there are no/few chances of staying in touch by way of informal conversions interpersonal, intraorganizational networking: teleworkers depend on their direct supervisors regarding promotion and information; because they cannot ask other people questions or show them their performance face-to-face, they are not so well informed about gossip/informal discussion which could advance their career mentoring remotely: difficult, because there is no opportunity for the managers to see how employees behave in action, so reduction/absence of mentoring may slow down career advancement and professional development of teleworkers the first three points suggest that the professional development and therefore the productivity of the organization could be impeded |
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| | | | | | | | | | | <ul style="list-style-type: none"> • professional isolation becomes more important when teleworkers telecommute more often |
| Telecommuting innovation and organization: A contingency theory of labor process change | To-maskovic-Devey, D. and Risman, B.J. | Social Science Quarterly, Vol. 74, No. 2, pp. 367-385 | 1993 | not listed in ranking | not listed in ranking | B | deductive | companies in North Carolina, chief decision-makers | n = 114 | <ul style="list-style-type: none"> • retaining employees is related to being an innovator regarding telecommuting, retaining employees is dependent on the size of the company (the greater the workforce, the more positive the effect of retaining employees due to telework) • clerical telecommuting is associated with a loss of control as well as with savings regarding labor costs • telecommuting is a chance to increase the productivity of employees • there is a significant positive relationship between employee retention and a professional form of teleworking; there are significant negative relationships between employee satisfaction and clerical/professional telework • employers like to promote telework if cost savings are realizable • positive gut reactions of chief decision-makers lead to more clerical telecommuting support • professional telecommuting increases when decision-makers see a chance to increase productivity, but when the remote workforce increases too heavily, they will stop the expansion of teleworking • if telecommuting is understood to enhance the |

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| | | | | | | | | | | job satisfaction of employees, it works, but the effect declines when the work force increases |
| Telework and gender: Implications for the management of information technology professionals | Beasley, R.E., Lomo-David, E. and Seubert, V.R | Industrial Management & Data Systems, Vol. 101, No. 9, pp. 477-482 | 2001 | no ranking | 2 | not listed in ranking | inductive | young professionals, analysts/programmers up to email administrators or heads of department, 13 diverse jobs | n = 132 IT professionals | <ul style="list-style-type: none"> • motivators for teleworking were identified which are (for women and men, in descending order): having more time with the children, having a flexible schedule, less time invested for traveling, having more time with the spouse, raising job satisfaction, being able to work without disturbances and alone, being away from any dress codes, no daily fight against traffic, saving money (travelling), less stress that is work related • additional motivator for women (descending order): job requirements and keep up the home can be combined, saving money due to less child care needed • additional motivator for men: catching up on work at home, because there was not enough time in the office to do so |
| The role of relationships in understanding telecommuter satisfaction | Golden, T.D. | Journal of Organizational Behavior, Vol. 27, No. 3, pp. 319-340 | 2006b | A | 4 | A* | deductive | telecommunication company, located in the United States, high-technology firm | n = 294 telecommuters | <ul style="list-style-type: none"> • the relationship between the amount of telecommuting and job satisfaction is curvilinear, which says that job satisfaction declines if the extent of telecommuting increases too much ($p < 0.001$) • there is a linear relationship between the amount of telecommuting and leader-member exchange (LMX) ($b = 0.22$, $p < 0.001$), LMX is related curvilinearly to job satisfaction, the relationship between the amount of telecommuting and job satisfaction is partially mediated by LMX quality (job satisfaction increases when LMX increases), it is also partially mediated by team-member exchange (TMX) quality (job satisfaction declines if the extent of TMX is too much), furthermore it is partially mediated by work-family conflict (highest job satisfaction when work-family conflict is low, work-family conflict declines when the amount of telework increases) |

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| The impact of superior-subordinate relationships on the commitment, job satisfaction, and performance of virtual workers | Golden, T.D. and Veiga, J.F. | The Leadership Quarterly, Vol. 19, No. 1, pp. 77-88 | 2008 | A | 4 | A* | deductive | a company from the high-tech industry, 25% of their workweek was spend working virtually by all respondents | n = 375 virtual worker | <ul style="list-style-type: none"> the extent of virtual work moderates the relationship between LMX and organizational commitment ($b = 0.22$, $p < 0.001$.) - high commitment arises if there is a high quality of LMX and an extensive usage of working virtually the extent of virtual work moderates the relationship between LMX and work satisfaction ($b = 0.20$, $p < 0.001$) - more virtual work increases job satisfaction if LMX is high, job satisfaction depends on the relationship with the supervisor the extent of virtual work moderates the relationship between LMX and work performance ($b = 0.15$, $p < 0.05$) - the higher the extent of virtual work, the higher the job performance (even if LMX is high or low) |
| The telework tradeoff: Stress mitigation vs. constrained restoration | Hartig, T., Kylin, C. and Johansson, G. | Applied Psychology: An International Review, Vol. 56, No. 2, pp. 231-253 | 2007 | B | 3 | A | deductive | Swedish national energy administration, (non-) teleworkers were studied (58 teleworkers, 43 non-teleworkers) | n = 101 employees | <ul style="list-style-type: none"> different reasons for teleworking: tasks need to be suitable for working from home (46.6%), needs or instructions of the employer (8.6%), company accessibility requirements (6.9%), transport possibilities and distance to travel (72.4%), responsibilities as a parent or child care (44.0% of teleworkers who have children at home), travel- and/or family-related reasons (81.0%), reduction of stress (traveling and gender are correlated as well as traveling and job responsibilities, parental responsibilities and child care are also correlated)• temporal and spatial overlap as well as mental and temporal overlap were perceived in the same degree by teleworkers, mental overlap is stronger than the spatial if there are children in the household; men perceived - in contrast to women - more spatial and women perceived more mental overlap, about 10% liked the temporal and/or spatial overlap between private and work life• a separate room (43.1%) or a separate area in a room (51.7 %) was arranged for working at home, employees with a specific room had fewer spatial overlaps regarding work/non-work life and reported a more positive overlap than those with a separate area in a room, correlation between separate area in a room and gender as well as job responsibilities (a separate room was used when the job responsibilities were high) and whether children are at home• (non-) teleworkers in general report that home was seen |

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| | | | | | | | | | | more as a place where they can recover than as a place full of demands, teleworkers see home more as a place full of demands, which increases if children are at home; women see the home more as a demanding than as a recovering place in comparison with men, (non-) teleworkers report the same effective recovery, the effective recovery was lower in the reports of women, men (teleworkers) report higher effective recovery than male non-teleworkers, less effective recovery among those who need to do childcaring or traveling |
| Attitudes towards telecommuting: The Turkish case | Iscan, O.F. and Nak-tiyok, A. | Journal of Information Technology, Vol. 20, No. 1, pp. 52-63 | 2005 | A | 3 | A* | deduc-tive | IT profes-sionals that are employ-eed in Turk-ish internet companies | n = 664 IT pro-fessionals | <ul style="list-style-type: none"> • women are more likely to do telework than men (b = 0.11***) • employees that are married are more likely to do teleworking than employees that are unmarried (b = 0.08*) • employees with young children (aged under five years) are related positively to teleworking (b = 0.09*) • employees with a big house are related posi-tively to teleworking • the distance between home and work is posi-tively related to teleworking (b = 0.08, p < 0.10) • employees that recognize more advantages for themselves (e. g. work-life quality, relationships within the family, less costs and time for travel-ing, higher efficiency) are positively related to telework (b = 0.22*) • employees that recognize more advantages for the company (e. g. performance of the organiza-tion, lower turnover rates, less absenteeism, less office space needed, capital saving) are positively related to telework (b = 0.12*) • employees that recognize more advantages for society (e. g. less air pollution, less mass trans- portation, less energy spent and less traffic) are positively related to telework (b = 0.11*) • employees that recognize more disadvantages for themselves are negatively related to telework (b = -0.20*) • employees that recognize more disadvantages for the organization are negatively related to tele-work (b = -0.09, p < 0.10) • employees with supportive colleagues are |

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| | | | | | | | | | | positively related to telework ($b = 0.25^{***}$) • employees that have a technology infrastructure and billing support in their company have a more positive view of telework ($b = 0.20^{**}$) |
| Telecommuting, control, and boundary management: Correlates of policy use and practice, job control, and work-family effectiveness | Kossek, E.E., Lautsch, B.A. and Eaton, S. | Journal of Vocational Behavior, Vol. 68, No. 2, pp. 347-367 | 2006 | B | 4 | A* | inductive and deductive | employees of two large financial and information services companies which are distributed geographically in the US, employees ($n = 245$) and supervisors ($n = 90$) were studied via a survey and interviews | $n = 335$ employees and supervisors | <ul style="list-style-type: none"> • performance was rated higher when employees were formal telework users • employees were more likely to stay at a company (less intention to leave the company) if there was a work-family benefit • depression was lower if the formal telework users were women that have children • there is a positive relationship between work hours and work-to-family conflict • turnover, depression, family-to-work conflict decrease if the psychological controlling of a job (when, where, how to work) gets higher • employees that build up boundaries between family and work have increased family-to-work conflict • well-being can be increased by high job control and a boundary strategy that forces separation of family and work |
| Homeworkers' usage of mobile phones; social isolation in the home-workplace | Lal, B. and Dwivedi, Y.K. | Journal of Enterprise Information Management, Vol. 22, No. 3, pp. 257-274 | 2009 | C | 1 | B | inductive | telecommunication company, located in the UK with team members that were geographically represented, semi-structured in- | $n = 25$ homeworkers | <ul style="list-style-type: none"> • majority of respondents work from home for three or more days; if they did not work at home, they drove to clients or the office in the company • homeworkers got a mobile phone from the company • employees that work from home are less involved in in-person (social) interaction with other employees, they tried to stay integrated via their mobile phones, mostly exchanged gossip, news about the company as well as information on how to do specific tasks • the mobile phone gives the opportunity to build |

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| | | | | | | | | depth inter-views | | up networks with colleagues to share information (also apart from work/home boundaries) and give their private telephone number to close colleagues, employees who did not use their mobile phone could not build up networks and sometimes it was a desire to work virtually alone; alternative ways of social interaction were also found by employees (increased contact with the family), working from home does not necessarily lead to social isolation |
| Supervisory approaches and paradoxes in managing telecommuting implementation | Lautsch, B.A., Kossek, E.E. and Eaton, S.C. | Human Relations, Vol. 62, No. 6, pp. 795-827 | 2009 | B | 4 | A* | inductive and deductive | 79% of the sample were telecommuters and 21% were non-telecommuters, employees were well educated | n = 90 dyads of superiors and their direct reports | <ul style="list-style-type: none"> • supportive supervisory behavior increases the outcome of remote employees • telework is related to less work-to-family conflict (employee's site), this has no impact on supporting behavior, performance or family-to-work conflict • if supervisors do not differentiate between supervision of teleworkers and non-teleworkers, the work-to-family conflict in both groups will decline, non-teleworkers have stronger work-family conflicts, monitoring both the same way is related positively and significantly to performance, new ways of monitoring are needed, because old and new ways of work need to be combined through supervision and for ending up in the full performance of employees • non-teleworkers feel that they do more than teleworkers because they are present and not privileged; work-family relationships and work-life seem to get harder for non-teleworkers • due to less time spent travelling, there is more time available for the family (although there is no flexibility regarding scheduling) • a lot of supervision leads to more helpful behavior on the site of the employees and may help to integrate teleworkers in teams in a way of active management, moreover constant contact leads to the feeling of not being isolated • if telecommuters separated work and family, this was beneficial in reducing the work-family conflict, supervisors expected that teleworkers were not available for any kind of family matters when they were working, which leads to less helping behavior among teleworkers, which leads to increased work-family conflict at the site of |

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| | | | | | | | | | | non-teleworkers because they are available if help is needed; if no separation was made, the teleworkers felt that they always needed to be available for supervisors and colleagues |
| A multivariate analysis of work-life balance outcomes from a large-scale telework programme | Maruyama, T., Hopkinson, P.G. and James, P.W. | New Technology, Work and Employment, Vol. 24, No. 1, pp. 76-88 | 2009 | not listed in ranking | 3 | A | deductive | British Telecommunications, telecommunications services are provided, teleworkers were studied, survey | n = 1,566 teleworkers | <ul style="list-style-type: none"> • teleworkers report that they are able to work where they want to (86.2%), can reduce commuting (83.1%), choose when to work (76.8%), have a (very) good work-life balance (73.7%), relationships with members of the household (72.2%), feel as if they work much longer (60.9%), spent more time with the family (55.3%), reduced travel related to business (52.0%), were less able to manage the hours worked (25.7%), had increased family conflict (7.3%) • teleworkers who are older than 55 years reported a more positive work-life balance than those of other ages ($p < 0.01$), teleworkers with different jobs have different reportings regarding work-life balance (sales and marketing employees reported a more positive work-life balance) • the longer hours employees work from home, the more positive their report of work-life balance ($p < 0.01$) • if employees feel that they work longer, there is a negative relationship to work-life balance ($r = -0.389^{***}$), but if they are free to choose where they work, it is positively correlated with work-life balance ($r = 0.373^{***}$) • variables that are related to time (when to work, feeling of working too long, control of working hours) are predicted by most of the model (72.9%), feeling of working longer and having less control of working hours leads to a lower work-life balance (and vice versa) • teleworkers that can reduce business travel |

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| | | | | | | | | | | <p>report a better work-life balance ($p < 0.01$)</p> <ul style="list-style-type: none"> • autonomy regarding the time is the most important for teleworkers positive work-life balance |
| Individual, social and situational determinants of telecommuter productivity | Neufeld, D.J. and Fang, Y. | Information & Management, Vol. 42, No. 7, pp. 1037-1049 | 2005 | B | 3 | A* | inductive and deductive | <p>multinational large company (division in Canada) which implemented a program for telecommuting (interviews)</p> <p>two companies in Canada received the survey</p> | <p>32 semi-structured in-depth interviews with teleworkers</p> <p>n = 100 employees for the survey</p> | <ul style="list-style-type: none"> • convictions and attitudes are linked with the productivity of a telecommuter; positive attitudes were reported if teleworkers perceive high productivity and teleworkers with low perceived productivity report negative attitudes related to teleworking; they also felt that the job got more complex, had a more negative relative advantage and was less compatible with family life (in the case of high perceived productivity it is vice versa) • high/low perceived productivity groups both reported that, before the implementation, a phase of trying out telework would have been desirable • there are no correlations between the convictions and attitudes and the productivity of teleworkers regarding telework with family status and/or gender • there is no relationship between convictions and attitudes and social interaction with clients, there are relationships between convictions and attitudes and social interaction with colleagues, managers, family members (in the case of positive convictions and attitudes there was more interaction and vice versa) • the interaction with families and managers has a positive impact on productivity (especially interaction with managers) • the relationship between convictions and attitudes and the availability of resources is positive as well as the relationship between the availability of resources and productivity • the relationship between convictions and attitudes and the environment free of distractions is positive |

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| | | | | | | | | | | <ul style="list-style-type: none"> • for explaining high or low productivity, the convictions and attitudes ($r = 0.94$, $p < 0.001$), interactions with managers ($r = -0.44$, $p < 0.001$) and interactions with family ($r = 0.22$, $p < 0.05$) are useful • for explaining convictions and attitudes, the interactions with colleagues ($r = 0.90$, $p < 0.001$), managers ($r = 0.77$, $p < 0.001$) and interactions with family ($r = -0.51$, $p < 0.001$) are useful |
| Home-based telework, gender, and the synchronization of work and family: Perspectives of teleworkers and their co-residents | Sullivan, C. and Lewis, S. | Gender, Work and Organization, Vol. 8, No. 2, pp. 123-145 | 2001 | B | 3 | A | inductive | in-depth semi-structured interviews with teleworkers and co-inhabitants who live in England | <p>n = 14 teleworkers</p> <p>n = 14 co-inhabitants</p> | <ul style="list-style-type: none"> • traditional roles in the household (men are breadwinners and women are responsible for childcare) do not change in cases of teleworking, for women childcare is an important motivation to telework, women get a chance to continue their careers besides performing in the household and childcare • the freedom to schedule their own work is the most noticed advantage of teleworking (reported by men and women), women furthermore relate to doing the household and family chores and men relate to helping their partners in these cases (but do not want to do them on their own), gender role identities are at play • the boundaries between work and family blur and work seems to be omnipresent, women use flexibility to do more in the household, men work extra hours, family becomes more involved and interested in work, men report less impact from family on work and higher impact from work at home; if women have young children they report a stronger interference of family into their work • if the teleworkers are self-employed, the partner seems to be more supportive to the family than to someone else's business • another advantage of teleworking is combining family and work tasks (women do it more often, |

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| | | | | | | | | | | belongs to gendered role, women are not co-breadwinners) |
| Perspectives of homeworkers and their partners on working flexibility and gender equity | Sullivan, C. and Smithson, J. | International Journal of Human Resource Management, Vol. 18, No. 3, pp. 448-461 | 2007 | B | 3 | A | inductive | interviews conducted in the home offices of the people | n = 12 teleworkers n = 12 co-inhabitants | <ul style="list-style-type: none"> • freedom and (temporal) flexibility is the major advantage of working from home, also less travelling time • work from home can be understood as a status symbol (senior employees are allowed to); results are evaluated, not the amount of time spent on working • traditional ideology of breadwinners (men) and homemakers (women) is still at play, men support women in the household and have more time for work, women use flexibility to synchronize homework, children (and work); there are also partnerships which split the duties of paid and unpaid work, so both are co-breadwinners |
| The possibilities and limits of telework in a bureaucratic environment: Lessons from the public sector | Taskin, L. and Edwards, P. | New Technology, Work and Employment, Vol. 22, No. 3, pp. 195-207 | 2007 | not listed in ranking | 3 | A | inductive | case study with semi-structured interviews with translators, human resources directors, employees responsible for a telework project, employees and chiefs of the human resources department, one trade union | n = 36 employees | <ul style="list-style-type: none"> • telework was understood as a motivational instrument for very good employees who negotiated it in personal contracts, some employees understood it as a concept of trust • new performance management systems were set up to control the productivity rate of teleworkers, also interviews on a regular basis • several management tools (e. g. network platform, collective mailbox) were set up • telework is a possibility to get out of the old working conditions, more workload is compensated by spending more time at home • telework was used to combine work and private life • there were no disadvantages for group works due to telework • social control leads to other ways of communication (more electronically) and higher self-control |

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| | | | | | | | | member, one project leader, managers and teleworkers) | | <ul style="list-style-type: none"> employees tried to stay visible by always being available |
| An empirical study of attitudes towards teleworking among information technology (IT) personnel | Teo, T.S.H., Lim, V.K.G. and Wai, S.H. | International Journal of Information Management, Vol. 18, No. 5, pp. 329-343 | 1998 | C | 2 | A | deductive | employees of an information technology company, located in Singapore, questionnaire survey | n = 285 employees | <ul style="list-style-type: none"> most employees are positive towards teleworking (89.4%), 10.6% are not, 86.3% would telework if possible, one to three days a week seems to be the best amount of teleworking if telework is offered, 11% are less likely to leave the company if telework is about to be implemented in a company, 14% more of the employees would like to remain in the company teleworking is influenced by having children (53.3%), getting married (27.7%), being pregnant (15.8%), using flexible hours to work (4.2%), children start to go to school (3.9%), without a reason, to reduce time and costs of traveling/traffic jams, care for older parents, study, others (each 3.2%), to get out of the work environment (1.4%), attend to personal requirements, due to becoming old and fragile (each 1.1%) advantages employees perceive of teleworking (less stress/time/costs with travel, higher autonomy, work at times employees are the most productive, planning and organizing of own time gets learned, better relationships to children, work and childcare contemporaneously, feeling of being treated as a professional, work-life quality will increase) disadvantages employees perceive of teleworking (less interaction with peers/business contacts, office space in the company gets lost/needs to be shared, less contact with others leads to stagnation in their own professional development, no longer able to participate in meetings, less access |

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| | | | | | | | | | | <p>to relevant materials, detrimental career development, being skipped in cases of promotion)</p> <ul style="list-style-type: none"> • advantages employers perceive of teleworking (reduced costs - overhead, office/parking space, transportation - easier recruitment, more efficient usage of resources, higher morale and productivity of employees, less turnover, sick leave, loss of goods) • disadvantages employers perceive of teleworking (problems regarding IT security; management and supervision of teleworkers is more difficult, maintaining/repairing equipment at homes of employees, investment at the beginning, fair compensation, company's image may decline (are they really working at home?)) • employees expect supervisors (28.4%) and co-workers (29.9%) to be generally supportive • training in how to telework (83.1%) as well as bill and equipment support are important for employees |
| Managerial telework allowance decisions - a vignette study among German managers | Beham, B., Baierl, A. and Poelmans, S. | International Journal of Human Resource Management, Vol. 26, No. 11, pp. 1385-1406 | 2015 | B | 3 | A | deductive | online questionnaire sent to German managers of different companies in different industries | n = 231 managers | <ul style="list-style-type: none"> • parents were more often familiar with telework experience • the availability of formal teleworking policies and experience increased with increasing company size • requests for telework were more likely agreed by managers if the employees were female ($b = 0.09$, $p < 0.05$), moreover, if the relationship between supervisor and employee was a very good one, the supervisors were more likely to approve telework ($b = 0.23$, $p < 0.01$) • the permission to telework and the high interdependency of tasks were correlated negatively ($b = -0.54$, $p < 0.01$) • if employees are critical regarding their knowledge and skills for the success of a department, managers are more likely to allow these employees to telework ($b = 0.10$, $p < 0.05$) • self-management skills are related significantly to approval to telework ($b = 1.13$, $p < 0.01$) • there is a positive relationship between individual experience with telework and approval to telework ($b = 0.18$, $p < 0.01$) • there is a positive relationship between the organizational culture (family-supportive) and |

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| | | | | | | | | | | <p>approval to telework ($b = 0.13, p < 0.05$)</p> <ul style="list-style-type: none"> • approvals regarding non-formal policies increase if the work-family culture is high, fewer approvals in the case of formal policies • approvals regarding non-formal policies increase if the employee is critical, approvals decrease in the case of formal policies |
| Avoiding depletion in virtual work: Telework and the intervening impact of work exhaustion on commitment and turnover intentions | Golden, T.D. | Journal of Vocational Behavior, Vol. 69, No. 1, pp. 176-187 | 2006a | B | 4 | A* | deductive | web survey in a large company that produces individual and commercial internet solutions | n = 393 teleworkers | <ul style="list-style-type: none"> • there is a positive relationship between the degree of telework and commitment to the organization ($b = 0.17^{***}$), which is partially mediated by work overload • there is a negative relationship between the degree of telework and diminishing turnover intentions ($b = -0.13^{**}$), which is mediated completely by work overload • there is a negative relationship between the degree of telework and work overload ($b = -0.13^{**}$) which is related to commitment to the organization ($b = -0.40^{***}$) |
| Impact of telework on exhaustion and job engagement: A job demands and job resources model | Saradeshmukh, S.R., Sharma, D. and Golden, T.D. | New Technology, Work and Employment, Vol. 27, No. 3, pp. 193-207 | 2012 | not listed in ranking | 3 | A | deductive | teleworkers from a company located in the United States, focused on supply chain management | n = 417 teleworkers | <ul style="list-style-type: none"> • the amount of telework was related to time pressure ($b = -0.098^*$), role ambiguity ($b = 0.128^*$) and role conflict ($b = -0.156^*$) which were also related to exhaustion (time pressure: $b = 0.088^*$, role ambiguity: $b = 0.155^*$, role conflict: $b = 0.138^*$), there is a direct relationship between the amount of telework and exhaustion as well ($b = -0.078^*$) • the amount of telework was related to autonomy ($b = 0.124^*$), feedback ($b = -0.215^*$) and social support ($b = -0.099^*$) which were on the one hand related to engagement (autonomy: $b = -0.299^*$, feedback: $b = -0.227^*$, social support: $b = -0.189^*$) and on the other hand to exhaustion: $b = -0.337^*$, feedback: $b = -0.108^*$, social support: $b = -0.276^*$), there is a direct relationship between the amount of telework and engagement as well ($b = -0.074^*$) |
| The (not so simple) case for | Collins, M. | New Technology, Work and | 2005 | not listed | 3 | A | inductive | case study at the Lloyd's Corporation | n = 854 observations, 700 worksheets, more | <ul style="list-style-type: none"> • the productivity of teleworkers and non-teleworkers did not differ significantly, but teleworkers are - in comparison to office-based employees |

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| teleworking: A study at Lloyd's of London | | Employ- ment, Vol. 20, No. 2, pp. 115-132 | | in ran- king | | | | | than 200 rec- ords, 39 em- ployees in focus groups | <ul style="list-style-type: none"> - more productive (23 %) if the measurement is done independently and there is no relation between increase of productivity and work hours or gender • costs (investments by the company) and benefits (increased productivity) are neutral • teleworkers were generally more satisfied with their work-life balance than their colleagues in the office and also had a lower rate of absenteeism, the ability to choose where to work as well as different behaviors raised satisfaction, team-work as well as the feeling of isolation rose • in this case there was a demand for teleworking |
| The effects of home-based teleworking on work-fam- ily conflict | Madsen, S.R. | Human Re- source De- velopment Quarterly, Vol. 14, No 1, pp. 35-58 | 2003 | not listed in ran- king | 2 | B | deduc- tive | seven for- profit com- panies in different but overlapping industries which al- ready have a telework program, survey with (non-) tele- workers | <p>n = 98 telework- ers</p> <p>n = 123 non-tel- eworkers</p> | <ul style="list-style-type: none"> • the work-family conflict was higher (signifi- cantly) on sites of non-teleworkers, especially: time- and strain-based (family interfering with the work) as well as strain- and behavior-based (work interfering with the family) • men have higher work-family conflicts than women, time- (p = 0.015) and behavior-based (p = 0.001) work interfering with family and gender as well as behavior-based family interfering with work (p = 0.025) • if the health status increases, the work-family conflict among teleworkers declines (time- (p = 0.000), strain- (p = 0.000) and behavior-based (p = 0.018) work interfering with family, behavior- based family interfering with work (p = 0.018)) • the relationship between the number of children of a teleworker and the time- (p = 0.005) and be- havior-based (p = 0.005) work interfering with family as well as with the time- (p = 0.002) and behavior-based (p = 0.033) family interfering with the work, no prediction among non-tel- eworkers • the longer hours a teleworker has been working (in total), the higher the perceived degree of time impairment in working with the family (p = 0.002) • teleworkers with small children have an increas- ing temporal conflict that emanates from the fam- ily and affects work (p = 0.028) |

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| Role conflict and flexible work arrangements: The effects on applicant attraction | Rau, B.L. and Hyland, M.M. | Personnel Psychology, Vol. 55, No. 1, pp. 111-136 | 2002 | A | 4 | A* | deductive | part-time MBA students at a university (midsized, midwestern) | n = 142 students | <ul style="list-style-type: none"> • if an organization offers the possibility to telework, it gains greater attraction ($p < 0.05$), this attraction increases if the role conflicts (work-to-family, family-to-work, work-to-school) are low |
| Telecommuting and organizational change: A middle managers' perspective | Watad, M.M. and Will, P.C. | Business Process Management Journal, Vol. 9, No. 4, pp. 459-472 | 2003 | C | 2 | B | deductive | survey among middle managers in the metropolitan area of New York-New Jersey | n = 140 middle managers | <ul style="list-style-type: none"> • teleworking is supported by middle managers due to few required resources and the limited extent, understood as a different working method which is not preferable for employees that need a lot of face-to-face contact with customers and co-workers, or that need material resources for doing their job • 46% of the sample highly recommended teleworking, although 56% would prefer local childcare instead of telework (44%) • 38% expect managing performance of employees to be difficult, but 37% think that this problem is easily solvable • employees are able to achieve their work goals (short-term), as 81% of the managers reported it ($p = 0.001$) and 58% of the sample reported that offsite assets are managed efficiently ($p = 0.001$) • culture is important in this study, which is to be repatriated to the cultural diversity of the survey region; if managers were more in favor of local childcare, they rated cultural problems ($p = 0.018$) higher than the other managers who were in favor of teleworking • there is daily interaction between managers and employees (rated by more than 81%, $p = 0.001$) • most of the business is done in the office by the managers |
| Dimensions of work-home culture and their relations with the use of work-home arrangements and work-home interaction | Dijkers, J.S.E., Geurts, S.A.E., den Dulk, L., Pepper, B., Tarris, T.W. and Kompier, M.A.J. | Work & Stress, Vol. 21, No. 2, pp. 155-172 | 2007 | not listed in ranking | 3 | A | deductive | the data was collected in three organizations in The Netherlands | N = 1,179 | <ul style="list-style-type: none"> • there is no significant relation between gender and work-home culture • the work-home culture support was rated stronger and the work-home culture hindrance was rated lower by employees of public organizations in contrast to employees of private organizations • if there is a high level of work-home culture support, employees are more likely to use part-time work, subsidized childcare and flexitime; if there are high levels of work-home culture hindrance, employees were more likely to do part- |

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| | | | | | | | | | | time work • if the work-home culture is supportive, the levels of interaction between work and home are more positive |
| Telecommuting's differential impact on work-family conflict: Is there no place like home? | Golden, T.D., Veiga, J.F. and Simsek, Z. | Journal of Applied Psychology, Vol. 91, No. 6, pp. 1340-1350 | 2006 | A | 4* | A* | deductive | high-tech company that already has a telework program | n = 454 employees | <ul style="list-style-type: none"> the relationship between the amount of telecommuting and work-to-family conflict is negative ($b = -0.27$, $p < 0.001$) which is moderated by job autonomy (the work-to-family conflict declines faster in cases of low autonomy when the amount of telework increases than in cases of high autonomy); the relationship is also moderated by the degree of flexibility to schedule (which says that the work-to-family conflict declines in cases of flexibility to schedule when the amount of telework increases) the relationship between the amount of telecommuting and family-to-work conflict is positive ($b = 0.19$, $p < 0.001$) which is moderated by the size of a household (if the household is large, the family-to-work conflict increases when the amount of telework increases ($b = 0.03$, $p < 0.05$); if the household is small, the family-to-work conflict decreases when the amount of telework increases) |

Appendix III: Association of research objectives, detailed research questions, interview questions and sources from which interview questions were derived

| Research objectives | Detailed research questions | Interview questions (IQ) | | Interview questions inspired by research from |
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| N/A | DRQ1 & ice breaking question | IQ1 | Based on your professional experience, please describe how leadership needs to be designed so that flexible work, i.e. flexible working hours and places, are possible. Flexible working places goes beyond the home office at this point and means all kinds of places, e.g. train station halls, cafés etc. | Mesu et al. (2013), Podsakoff et al. (1990), Whyman and Petrescu (2015) |
| O2 & O3 | DRQ1 & DRQ3 | IQ2.1 | What are (leadership) technologies that are important for flexible working (times, places)? | Coenen and Kok (2014), Ibrahim (2015), |
| | | IQ2.2 | How do you use suitable hardware and software in the context of managing a mobile workforce? | Kingma (2016), Mesu et al. (2013), Podsakoff et al. (1990), Whyman and Petrescu (2015) |
| O2 & O3 | DRQ1 | IQ3.1 | Is the leadership of mobile employees different from the leadership of employees who are on-site? | Coenen and Kok (2014), L. Harris (2003), Ibrahim (2015), Illegems and Verbeke (2004), |
| | | IQ3.2 | If so, how? Please provide examples from your professional experience. | |

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| | | IQ3.3 | How often do you communicate with your employees? | Illegems et al. (2001), Mesu et al. (2013), Podsakoff et al. (1990), Watad and Will (2003), Whyman and Petrescu (2015) |
| O2 & O3 | DRQ1 | IQ4 | How does the leadership of mobile employees differ when they “only” work part of the time at the company premises and “only” part of the time in flexible workplaces? | Mesu et al. (2013), Nordbäck et al. (2017), Whyman and Petrescu (2015) |
| O2 & O3 | DRQ2 | IQ5.1 IQ5.2 IQ5.3 | What role does trust play between employees and their manager when they [employee / manager] work flexibly? Please provide examples from your everyday work. How do you see the connection between trust and control? | Hislop (2009), Jarvenpaa and Leidner (1999), Whyman and Petrescu (2015) |
| O2 & O3 | DRQ2 | IQ6 | Imagine that you are leading a team of employees who work flexibly. What role does trust among employees play in this case? | Jarvenpaa and Leidner (1999), Whyman and Petrescu (2015) |
| O2 & O3 | DRQ1, DRQ2 & DRQ3 | IQ7 | <i>Interviewer presents and briefly explains the model.</i> Please take a critical position on the model and the constructs. | N/A |
| | | IQ8 | Do you have anything else you would like to say in connection with the above topics? | N/A |

| | | | | |
|-----|---------|-----|---|-----|
| | | IQ9 | Do you have further questions? | N/A |
| N/A | Closing | N/A | Thank you very much for your participation in this study! If you wish, I will gladly send you the results after completion of my PhD thesis at the latest. Please give me your email address. | N/A |



Appendix IV: Interview guide

1. Introduction: Objectives and procedure of the interview

1.1. Interviewer: Thank you for supporting me in my qualitative research project, which will form the basis for my Germany-wide quantitative research as part of my doctoral thesis. The goal of this interview is to gain a better understanding of how employees who work outside your company should be led. Furthermore, the results will be used to prepare the quantitative study.

1.2. Brief introduction of the interviewer - personal background

1.3. *Interviewer*: Do you have any questions before we begin?

1.4. Enter personal or company data

Location and type of interview (in person/telephone):

Company Name:

Industry:

Number of employees:

Annual sales/total assets:

Name of interviewee:

Current position and background:

Years of professional experience:

Years of professional experience in current position:

Please answer all of the following questions based on your own perspective as well as your professional experience in the company (or for management consultants: Your general perspective and not related to a single company). Please feel free to give explicit examples or justify your answers.

2. Leadership & mobile work

IQ1: Based on your professional experience, please describe how leadership needs to be designed so that flexible work, i.e. flexible working hours and places, are possible. Flexible working places goes beyond the home office at this point and means all kinds of places, e.g. train station halls, cafés etc.

IQ2.1: What are (leadership) technologies that are important for flexible working (times, places)?

IQ2.2: How do you use suitable hardware and software in the context of managing a mobile workforce?

IQ3.1: Is the leadership of mobile employees different from the leadership of employees who are on-site?

IQ3.2: If so, how? Please provide examples from your professional experience.

IQ3.3: How often do you communicate with your employees?

IQ4: How does the leadership of mobile employees differ when they “only” work part of the time at the company premises and “only” part of the time in flexible workplaces?

3. Trust & mobile work

IQ5.1: What role does trust play between employees and their manager when they [employee / manager] work flexibly?

IQ5.2: Please provide examples from your everyday work.

IQ5.3: How do you see the connection between trust and control?

IQ6: Imagine that you are leading a team of employees who work flexibly. What role does trust among employees play in this case?

4. Closing

IQ7: Interviewer presents and briefly explains the model. Please take a critical position on the model and the constructs.

IQ8: Do you have anything else you would like to say in connection with the above topics?

IQ9: Do you have further questions?

Interviewer: Thank you very much for your participation in this study! If you wish, I will gladly send you the results after completion of my PhD thesis at the latest. Please give me your email address.

Appendix V: Dimensions, themes, categories, and data

| Aggregate dimension, 2nd order themes and 1st order concepts | Representative data |
|---|--|
| Overarching aggregate dimension: Technological aspects of virtual leadership | |
| <i>1. IT infrastructure</i> | |
| A. Usage of mobile devices | <p>A1. "What I am getting at is that two years ago we started replacing every stationary PC here in the company with a mobile workstation" (I1).</p> <p>A2. "And, of course, the smartphone has become a daily companion somewhere in the meantime, to communicate, to organize one's work, to retrieve emails. Of course, this works from anywhere then" (I2).</p> |
| B. Usage of (virtual) networks | <p>B1. "We had all possibilities via laptop. You could access our data, but also the customer data via the software TeamViewer" (I6).</p> <p>B2. "One of the basic requirements for flexible working is very powerful IT equipment for employees. That means I got to know it at a former employer who had several thousand SAP workstations. That these employees had access to the SAP network from everywhere" (I10).</p> |
| C. Availability of network connection | <p>C1. "Then, of course, it is important that you use a technique that works well at low thresholds. Especially in Germany there are big problems with the mobile phone network. Is that even possible? Does it work? Do I have internet access everywhere?" (I3).</p> <p>C2. "You have to have the stability to be able to access servers, information and the like with your devices wherever you are, so that you can process this information very quickly" (I11).</p> |
| <i>2. Software</i> | |
| D. Usage of video conferencing | <p>D1. "I think that these video conferences are not really unpleasant, I have to say. Videoconferencing leads to a very focused</p> |

- discussion of the topic and that one is preparing oneself, right” (I7).
- D2. “In the meantime, you may want to produce or discuss results again via video conference” (I5).
- E. Sending messages digitally
- E1. “A communication software, Microsoft Teams for example, where you can chat with each other regularly, exchange messages” (I5).
- E2. “He can then assess the customer much more quickly, he can be there in 10 minutes, 20 minutes or half an hour, and the fitter is automatically informed by SMS or email as to what is happening” (I6).
- F. Sharing the calendar
- F1. “Exactly. Yes, share calendars. Again, all within the framework of data protection and so on. But of course, that's what I just meant with this appointment management. Group members know where he is and what he does. Can I reach him, can I not reach him?” (I3).
- F2. “I have always unlocked my complete calendar for everyone, and everyone knew what I was doing. And they also unlocked all calendars for me” (I4).
- G. Exchanging documents
- G1. “Yes, simply to ensure that access to and updating of working materials is guaranteed. Yes, very important” (I3).
- G2. “Because we have a central server here that we can all access where we have stored data” (I11).
- H. Usage of collaboration software
- H1. “That means I have to think carefully about which collaboration tools I use. Or which collaboration tools do I use so that not only employee X knows this, but also employee Y, who may also be involved in this project” (I8).
- H2. “Leadership then requires considerable resources, that is one side, so, technical resources, such as Teams, which we use at the moment” (I12).

Overarching aggregate dimension: Transformational leadership

3. Demands on leaders when leading employees that work flexibly

- I. Time required for leadership
- I1. “The communication challenge is greater if I don't have direct access to the employees. By access, however, I also mean

that an employee does not have direct access to his or her supervisor. Conversations in the hallway, at the copier, in the break room are a thing of the past when I'm on the move. That means I always have a controlled conversation situation" (I3).

I2. "And therefore, I actually need more structure for the mobile employees. Maybe they are not working at the moment. I don't even know it. Maybe I see 9 am in the calendar, but he has no appointment now. But maybe he doesn't want to start until 10 am today. [...] When I say place and time, I have to respect that, it is also time. And then I must - worst case - briefly ask him, if we can talk at that moment, or when is convenient for them that day? Because maybe this employee is bringing his children to the kindergarten or is going to the supermarket for his sick mother" (I4).

J. Transparency
simplifies control

J1. "At the end of the day, you can see that in the results. I think that trust is perhaps a bit overrated. I can do it. I can tell from the results whether something works or not. I don't have to worry so much about the question whether I trust or not, I really have to say" (I9).

J2. "Then I rather have transparency. And transparency does not equal control. In the end, if the team is well organized, if the leadership works, then I don't need control, I need transparency" (I5).

K. Setting goals
for/with employees

K1. "You have to lead by objectives, so to say, and find ways to shape this together with the employees" (I2).

K2. "Leadership is shaped by agreeing on objectives. [...] Yes, if I have agreed on objectives and these objectives are aligned with the employee [...] then everybody can do what they want to do" (I9).

L. Taking care of the
individual

L1. "But I believe that, especially when working mobile, it is even more important to take care of the individual. So, if you don't see each other all the time, it's very important to talk to the individual employee or leader and also have a look at how they are doing?" (I4).

L2. "In other words, when I see that I have an older employee who may not be very flexible in his willingness to change, but who is an ace in his field. And then I see the bottom line for the company. Then I integrate them differently [...] and give them much more freedom" (I10).

M. Facial expressions and gestures M1. "And the ones who come in here you can ask what's going on with the family? Or you can tell by the way he comes in. I cannot see that on the phone" (I6).

M2. "This can already happen through thoughtless statements, even if one does not intend this, it can even be triggered by facial expressions" (I3).

4. *Common demands on leading employees*

N. I need a vision N1. "If you do not provide the company with a clear vision and mission and the goals and values derived from it, disorientation arises in many places. It is always easy to justify it. So, you would like to give an employee something to help him or her orientate themselves. Every day, he can test himself on what he does, on the question 'How does what I am doing contribute to the company's goals and if it doesn't, then maybe I have dealt with the wrong issues.' That's why I think a corporate vision is very, very important today, not only from the point of view of the company, but I also think that this topic is now being demanded by younger generations of employees as well, with a very clear desire for the reason: 'Why do I do what I do?' And this is actually very natural" (I1).

N2. "These points are eminently important and a basic requirement. So, I need a vision, I need a goal, a set of values that everyone can align themselves with, because as a manager I often lead at a distance. And that means that everyone has to orient themselves to a vision or a direction and stick to it" (I5).

O. Leading by example O1. "So basically, as a colleague, as an employer, I must always be a role model. But a superior is also a human being. And a superior also makes mistakes. And I think that the employees must be aware of this, and this is actually a fundamental

problem, which has nothing to do with home office, flexible working. I have to be a role model for the employees there, too, by showing them that I also make mistakes. I expect my employees to show me my mistakes” (I8).

O2. “Nevertheless, it is possible to bring such a culture to life through example, through a positive image of people. But I have to set an example, and I have to set it authentically” (I10).

P. Individual interaction with employees

P1. “And I can work wherever I want, and that is not a privilege of mine alone, but every employee has that, and it goes right through from the facility manager to the board of directors, and it is all done in the same way, all equipped with the same quality” (I1).

P2. “As an employer, I have a duty of care towards my employees, just to ask how things are going here, what is going on? We are not so big here that I assign a number to everyone, but for me it is an individual. I also go to the apprentice and ask how their day was or if they enjoyed it. We both know that not every day is equally happy. But the thing is, if I don't ask, the employee has the feeling that I am not interested in him or that his work is not appreciated enough. And if I then seek these conversations accordingly, I learn a lot, even between the lines. And the employee knows that his work is valued. And that makes a big difference, that the employee feels an affiliation with the company” (I6).

Overarching aggregate dimension: Trust

5. Trustful at work

Q. Of course, you have to trust the employees

Q1. “So, mobile working is not possible without trust” (I5).

Q2. “This is exactly the issue you are addressing, which was the most difficult one for me. How much trust do I have in the employee that he can do his job, so to say, even without knowing that I could come at any time, a result that could be seen, that he will continue working anyway. That is very, very, very

difficult. I think you have to have a much higher level of trust in employees” (I12).

R. Balancing trust and control

R1. “Sometimes I test this by saying something, sometimes just saying something tactically, then waiting to see if I get a reaction that suggests that the person has something on his mind that he wanted to get rid of, but was not sure if he should say it on his own” (I9).

R2. “And these coming and going times then form the framework in which one thinks that the employee has worked efficiently. But this is a fallacy. Efficient working can look quite different, and in the end it is all about getting tasks done” (I10).

S. Trust among employees as a success factor

S1. “There must be the feeling that the person who is now at home is fulfilling his tasks, his duties there. Yes, exactly. That must be given among one another, otherwise there is a poor atmosphere among one another” (I9).

S2. “And the big picture wins. And just as I have to have this basis of trust from top to bottom, and if I may exaggerate, and from bottom to top, I also have to have it horizontally, otherwise the whole thing will not work” (I10).

6. *Fostering trust*

T. Implementation of trust-building activities

T1. “And small talk is a trust building activity or means creating trust and bringing transparency” (I8).

T2. “We also do team workshops. Once a year I and my team, whether they were managers or employees which I led as well, so, I said, once a year we take that time” (I4).

Overarching aggregate dimension: Managing a flexible workforce

7. *Acquisition and development of human capital*

U. Recruiting the right people that can work flexibly

U1. “Yes, I have to feel that he is a good fit for the situation and whether I like what I expect in terms of the way we work or how we work here. Does the employee fit in? That is always difficult to determine in advance. It is very easy to do this

when you have trial workdays or something similar, to see if something is basically right and fits” (I1).

U2. “I need employees at first, and that's where it starts for me, I have to start with the recruitment of personnel when I think about flexible working hours, when I think about flexible working places, I have to start with the recruitment of personnel. I must recognize in the personnel selection that my employees are able to work independently in the future, that they bring along strong social skills, in addition, an entrepreneurial expertise – that they are entrepreneurs within the enterprise” (I8).

V. Trainings in the usage of technology

V1. “And that would be bad, of course. So, if someone in the leading role says ‘I want to continue writing emails’, but the world is already talking in Slack, it would be like trying to communicate with your families and friends today without WhatsApp or similar services” (I1).

V2. “That you need to have training in the company accordingly for the leader in particular, so that he/she learns to deal with it and to train the employee in the application of the technology” (I12).

W. Self-organized employees as a demand

W1. “When you’re at home, for the employees themselves, I think it is a challenge to have to organize their working day even better” (I2).

W2. “We talk as a team about what we intended to do today and why we did not succeed. But it has nothing to do with controlling someone, it has something to do with self-organization” (I5).

8. Fostering collaboration and communication

X. Team spirit leads to good atmosphere

X1. “They are not just a resource, but also people you enjoy working with” (I4).

X2. “If you have a good working atmosphere and if you trust each other, then I have often experienced in my daily work that when pressure from outside comes in, it is not always easy. You can then bear it better as a team” (I7).

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| Y. Sensitivity for communication style and rules | <p>Y1. "I just have to pay more attention to how I implement this digitally. With hands that I also hold up in front of the monitor, which I would not normally do, because I keep my hands in a kind of downward position" (I8).</p> <p>Y2. "You need to talk to people in a much more structured way. You have to choose your words much more because you cannot underline them with a smile or a grim expression or with hands and so on. Especially when you are on the phone, it is very important that you choose your words in a very different way. Choose much more carefully. So, much more difficult" (I12).</p> |
| Z. Ensuring informal communication | <p>Z1. "Yes, sometimes, as we have done in the merger, we simply have a digital wine or beer tasting in the evening or a digital quiz night to create the social closeness that I might not be able to do because I do not have the opportunity to meet. So, I have no room. I have to try to create it digitally" (I5).</p> <p>Z2. "I maintain the relationship level only in direct contact. Just like we have it now. That's where I take care of the relationship level of our communication" (I7).</p> |
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Appendix VI: Overview of generated items

| Aspect | Empirical basis (from the literature or direct interview quote(s)) | Item |
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| Communication with laptop | “What I am getting at is that two years ago we started replacing every stationary PC here in the company with a mobile workstation” (I1)., “Of course, that's part of it by default somehow, that you also equip the employees properly” (I2). | Our leaders use laptops to communicate with employees. |
| Communication with smartphone | Coenen and Kok (2014), Lal and Dwivedi (2009), “These are actually the two things that are now the standard with the cell phone; writing emails and SMS” (I4). | Our leaders use smartphones/cell phones to communicate with employees. |
| Communication with tablet | “We have a meeting with our software manufacturer in 14 days, who will then make it possible for our people to fill out their work reports digitally with their tablet and deposit the articles beforehand when sending them. This will make our work easier, so that the invoice can be written immediately, without the accountant having to enter the articles” (I6). | Our leaders use tablets to communicate with employees. |
| Unified hardware | “And that's why we have an iPhone, because we have someone responsible for IT and so on, and she only has to deal with one type of device” (I9). | Our leaders use only one manufacturer's hardware, so maintenance/troubleshooting is easy. |
| Use of (virtual) networks | “Especially those who are not on-site must of course be well connected. They must access here to the firm network” (I2)., “Yes. And we also have a [...] cloud system” (I9). | Our leaders access and use our company's (virtual) networks (e.g., cloud or VPN) from various locations. |

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| Internet connection | “You have to have the stability to be able to access servers, information and so on with your devices wherever you are, so that you can process this information very quickly” (I11). | Our company provides leaders with a stable Internet connection for their work locations/times. |
| Internet speed | “We experience it right now during the Corona crisis, how many people do not have a fixed line connection, i.e., no DSL connection anymore or live in areas where LTE barely works. That means, my leadership actually fails because of the technology. And that is a huge problem for me, especially in the less developed areas, which we have in region 1 at the moment. It is the biggest problem for me” (I12). | Our company provides leaders with a very good internet speed (upload/download) for their work locations/times for their purposes. |
| Mobile network | “Then, of course, it is important that you use a technique that works well at low thresholds. Especially in Germany there are big problems with the mobile phone network. Is that even possible? Does it work? Do I have internet access everywhere?” (I3). | Our company provides leaders with a stable mobile network for their work locations/times. |
| Video conferencing | “So video and on-site staff are relatively similar” (I7)., “And now you are in a meeting, a virtual one, and have an outcome that gets at least 80 percent close to the result [of a face-to-face meeting]. That is quite interesting. [...] Of course, you still have to meet from time to time, so you can have a drink together [...]. But working on this agenda works great on a virtual basis” (I9)., “What certainly does not work is if it has a disciplinary character. In my opinion, this is only possible in a personal conversation, and in my opinion, respect for the other person is also necessary, even if it is perhaps an unpleasant situation, but I have to show my colors as a leader and cannot hide behind the screen or behind the | Our leaders use video conferencing to communicate with employees. |

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| | camera” (I10)., “And maybe do a little more about visual things, that you prepare an Excel chart or whatever, which you then talk about together” (I12). | |
| Telephone conferencing | “So, I also talk to him on the phone via FaceTime. I ride my bike from city 8 to here every day. And I've already gotten into the habit of making phone calls on the bike. (I8). | Our leaders use conference calls to communicate with employees. |
| Email | Coenen and Kok (2014), Franssila (2013), Taskin and Edwards (2007), “And, of course, the smartphone has become a daily companion somewhere in the meantime, to communicate, to organize one's work, to retrieve emails” (I2)., “These are actually the two things that are now the standard with the cell phone; writing emails and SMS” (I4). | Our leaders send emails to communicate with employees. |
| Chat | Coenen and Kok (2014), “A chat and acquisition channel, a general channel, a chat corner” (I5). | Our leaders use chats (e.g., messenger services) to communicate with employees. |
| SMS | “These are actually the two things that are now the standard with the cell phone; writing emails and SMS” (I4)., “He can then assess the customer much more quickly, he can be there in 10 minutes, 20 minutes or half an hour, and the fitter is automatically informed by SMS or email as to what is happening” (I6). | Our leaders use SMS to communicate with employees. |
| Share calendar | “When you say, "People, I'm sharing my calendar," then we were faced with the fact that as a human resources manager you also have difficult appointments. My managers always knew that I was having a conversation with this and that employee and everyone knew that manager XY hasn't performed well for quite some time now. Why do you think she's there now? But that was not an issue at all” (I4). | Our leaders share their calendars with employees. |

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| Document exchange | Coenen and Kok (2014), Taskin and Edwards (2007), “Of course, we already had shared drives on which documents are stored. And we have always had that with our employees in the human resources department. We have drives where all our references are stored or they are stored in libraries. We've actually always known it this way” (I12)., “But you always have to keep in mind. One can be absent, diseases, whatever I know. So, and then this knowledge must be available somewhere. And therefore, I find it also in principle good that I can define not only the file location as such. You can access it, but also that I am perhaps in exchange with a few colleagues” (I11). | Our leaders use digital repositories (digital folder structures/databases) to share documents. |
| Collaboration software | “I am of course interested in such communication systems as Teams, Slack etc. All those that contribute to the collaboration of companies are essential to me. We have noticed that in the last five years we have made this change. We've seen systems that standardize information within the company move away from Word documents and Excel spreadsheets to Confluence systems, for example, but also away from email to messenger-like systems, such as Slack in our case. In my view, these are the minimum things that are needed, so to say, to bring this flexibility into the work” (I1)., “A communication software, Microsoft Teams for example, where you can chat regularly with each other, exchange messages, share data with each other, but also have video conferences. Collaboration, communication collaboration software” (I5)., “Or which collaboration tools I use so that not only employee X knows this, but also employee Y, who may also be involved in this project” (I8). | Our leaders use collaboration software (e.g., Teams or Confluence). |

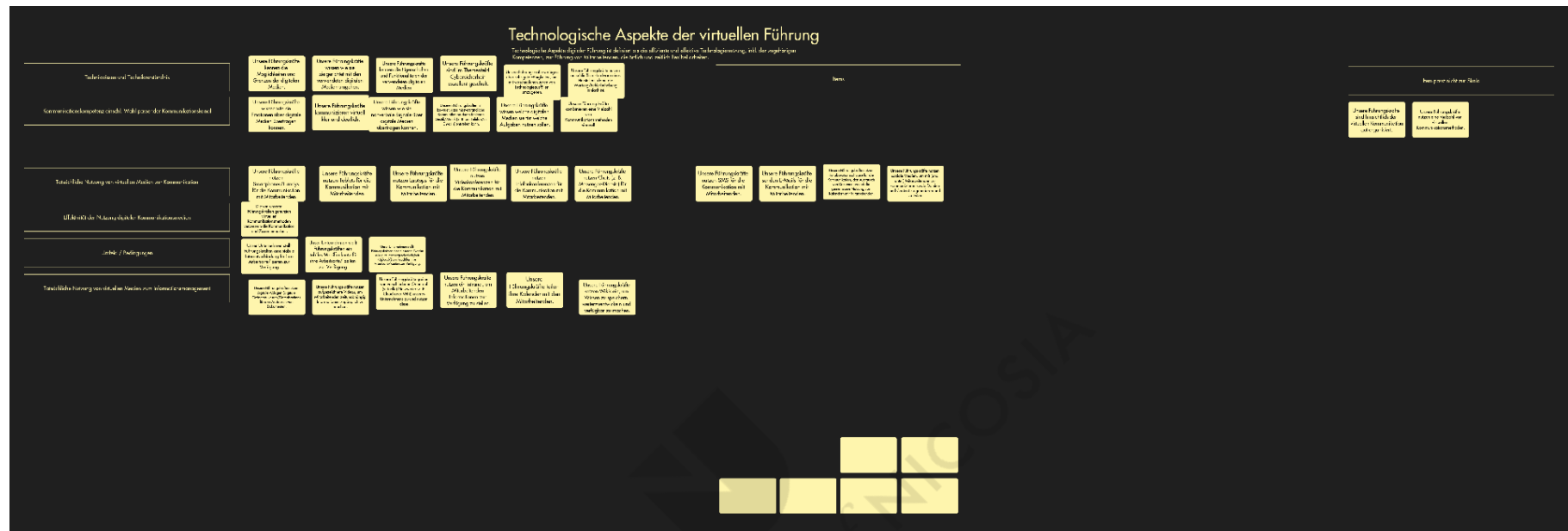
| | | |
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| Wiki | Hurt et al. (2019), McKibbon et al. (2013), “Or from Atlassian – the wiki – Confluence” (I5). | Our leaders use wikis to store, develop and make knowledge available. |
| Videos | Liu et al. (2018) | Our leaders use recorded videos to make information accessible to employees regardless of time. |
| Intranet | Liu et al. (2018) | Our leaders use an intranet to make information available to employees. |
| Social media | Ghosh et al. (2014), Leonardi et al. (2013), Liu et al. (2018), “Because these are networks, so I have an internal network, which is then the collaboration software. There are also possibilities to build up a kind of company Facebook, with Microsoft Yammer for example” (I5). | Our leaders use social media to communicate with (and among) employees. |
| Clear communication | Roman et al. (2019), “Our employees are equipped with extremely high-definition cameras. This means that I can already see when the corner of my eye goes up or when there is a nuance” (I8). | Our leaders communicate clearly and concisely virtually. |
| Well organized communication | Roman et al. (2019), “If an employee sends me something in the operational business, we are only talking about the classic operational business here, I don't want it sent by email, but he rather has to upload it in SharePoint, in Teams, in One-Drive, according to the guidelines. What he sends me, of course, is a vacation ticket” (I8). | Our leaders are well organized in terms of virtual communication. |

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| Misunderstandings in communication | Roman et al. (2019), “Our employees are equipped with extremely high-definition cameras. This means that I can already see when the corner of my eye goes up or when there is a nuance” (I8). | Our leaders are aware that misunderstandable communication can result from a lack of gestures/facial expressions (e.g., on the phone/in emails). |
| Diverse virtual communication methods | Roman et al. (2019), “If an employee sends me something in the operational business, we are only talking about the classic operational business here, I don't want it sent by email, but he rather has to upload it in SharePoint, in Teams, in One-Drive, according to the guidelines. What he sends me, of course, is a vacation ticket” (I8). | Our leaders use a variety of virtual communication methods. |
| Meaningful combination of communication methods | Roman et al. (2019), “If an employee sends me something in the operational business, we are only talking about the classic operational business here, I don't want it sent by email, but he rather has to upload it in SharePoint, in Teams, in One-Drive, according to the guidelines. What he sends me, of course, is a vacation ticket” (I8). | Our leaders combine a variety of communication methods in a meaningful way. |
| Chosen communication method | Roman et al. (2019), “If an employee sends me something in the operational business, we are only talking about the classic operational business here, I don't want it sent by email, but he rather has to upload it in SharePoint, in Teams, in One-Drive, according to the guidelines. What he sends me, of course, is a vacation ticket” (I8). | The virtual communication methods used by our leaders improve communication and collaboration. |
| Skills | Roman et al. (2019), “That you have to have appropriate training in the company, both for the leader in particular, that he just learns to deal with it and train | Our leaders deal with different types of technology failures in a goal-oriented manner. |

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| | the employee in the use of technology. That he also knows how Teams works” (I12). | |
| Cybersecurity | Roman et al. (2019), “Flexible working is a big problem for us in this respect because we have data protection and because we are bitten once. The fact that an employee has committed data theft” (I6). | Our leaders operate in a digitally secure manner so that cybersecurity prevails. |
| Properties of virtual media | Müller and Antoni (2020) | Our leaders make targeted use of the features and functionalities of the digital media they use. |
| Possibilities & limits | Müller and Antoni (2020) | Our leaders use digital media within their capabilities and limitations. |
| Task centered usage | Coenen and Kok (2014), Müller and Antoni (2020), “If an employee sends me something in the operational business, we are only talking about the classic operational business here, I don't want it sent by email, but he rather has to upload it in SharePoint, in Teams, in One-Drive, according to the guidelines. What he sends me, of course, is a vacation ticket” (I8). | Our leaders use digital media appropriately for the task at hand. |
| Dealing with virtual media | Müller and Antoni (2020) | Our leaders use digital media in a targeted manner. |
| Nonverbal signals | Müller and Antoni (2020), “Our employees are equipped with extremely high-definition cameras. This means that I can already see when the corner of my eye goes up or when there is a nuance” (I8). | Our leaders transmit nonverbal signals through digital media. |

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| Emotions | <p>“Because the human being is not only work, but rather a human which consists of a multitude of parts, and of course social life is also part of this. And from my point of view, social life cannot be excluded from work, not in the long run” (I5)., “But I think it's even more important if the employees are working flexibly, because they often can't connect every word they hear with their facial expression, because when they're on the phone, you can only try to express an emotion through your language. Of course, this is much more difficult than when you have the employee on-site, because you can confront them in a completely different way. That's why I think it's even more important to take the employee's sensitivities into account and to respond to his or her problems on the phone” (I12).</p> | Our leaders transmit emotions via digital media. |
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Appendix VII: Example of H-SLT



Appendix VIII: German and English versions of the items

| Technological requirements of virtual leadership Technological Scale of Virtual Leadership is defined as the efficient and effective use of technology, including the associated competencies, to lead employees who work flexibly in terms of location and time. Technologische Anforderungen virtueller Führung Technologische Skala virtueller Führung ist definiert als die effiziente und effektive Technologienutzung, inkl. der zugehörigen Kompetenzen, zur Führung von Mitarbeitenden, die örtlich und zeitlich flexibel arbeiten | | | |
|---|-----|--|--|
| Dimension | No. | Item English | Item German |
| A. Actual use of virtual media A. Tatsächliche Nutzung virtueller Medien | 1. | Our leaders use laptops to communicate with employees. | Unsere Führungskräfte nutzen Laptops für die Kommunikation mit Mitarbeitenden. |
| | 2. | Our leaders use smartphones/cell phones to communicate with employees. | Unsere Führungskräfte nutzen Smartphones/Handys für die Kommunikation mit Mitarbeitenden. |
| | 3. | Our leaders use tablets to communicate with employees. | Unsere Führungskräfte nutzen Tablets für die Kommunikation mit Mitarbeitenden. |
| | 4. | Our leaders access and use our company's (virtual) networks (e.g., cloud or VPN) from various locations. | Unsere Führungskräfte greifen von verschiedenen Orten auf (virtuelle) Netzwerke (z. B. Cloud oder VPN) unseres Unternehmens zu und nutzen diese. |
| | 5. | Our leaders use video conferencing to communicate with employees. | Unsere Führungskräfte nutzen Videokonferenzen für die Kommunikation mit Mitarbeitenden. |
| | 6. | Our leaders use telephone conferences to communicate with employees. | Unsere Führungskräfte nutzen Telefonkonferenzen für die Kommunikation mit Mitarbeitenden. |

| | | | |
|--|-----|--|--|
| | 7. | Our leaders send emails to communicate with employees. | Unsere Führungskräfte senden E-Mails für die Kommunikation mit Mitarbeitenden. |
| | 8. | Our leaders use chat (e.g., messenger services) to communicate with employees. | Unsere Führungskräfte nutzen Chats (z. B. Messenger-Dienste) für die Kommunikation mit Mitarbeitenden. |
| | 9. | Our leaders use SMS to communicate with employees. | Unsere Führungskräfte nutzen SMS für die Kommunikation mit Mitarbeitenden. |
| | 10. | Our leaders share their calendars, including appointment content, with employees. | Unsere Führungskräfte teilen ihre Kalender inkl. der Terminhalte mit den Mitarbeitenden. |
| | 11. | Our leaders use digital repositories (digital folder structures/databases) to share documents. | Unsere Führungskräfte nutzen digitale Ablagen (digitale Ordnerstrukturen/Datenbanken) für den Austausch von Dokumenten. |
| | 12. | Our leaders use collaboration software (e.g. Teams or Confluence). | Unsere Führungskräfte nutzen Kollaborationssoftware (z. B. Teams oder Confluence). |
| | 13. | Our leaders use wikis to store, develop and make knowledge available. | Unsere Führungskräfte setzen Wikis ein, um Wissen zu speichern, weiterzuentwickeln und verfügbar zu machen. |
| | 14. | Our leaders use recorded video to make information accessible to employees regardless of time or location. | Unsere Führungskräfte nutzen aufgezeichnete Videos, um Mitarbeitenden zeitunabhängig Informationen zugänglich zu machen. |
| | 15. | Our leaders use an intranet to make information available to employees. | Unsere Führungskräfte nutzen ein Intranet, um Mitarbeitenden Informationen zur Verfügung zu stellen. |
| | 16. | Our leaders use internal company social media to communicate with (and among) employees. | Unsere Führungskräfte nutzen unternehmensinterne soziale Medien, um mit (und unter) Mitarbeitenden zu kommunizieren. |

| | | | |
|---|-----|--|---|
| | 17. | Our leaders enable virtual informal communication apart from the work task (e.g., virtual coffee kitchen). | Unsere Führungskräfte ermöglichen virtuell informelle Kommunikation abseits der Arbeitsaufgabe (z. B. virtuelle Kaffeeküche). |
| B. (Organizational) support to ensure the ability to work B. (Organisationale) Unterstützung zur Gewährleistung der Arbeitsfähigkeit | 18. | Our leaders use mostly one manufacturer's hardware so maintenance/troubleshooting is easy. | Unsere Führungskräfte nutzen überwiegend Hardware eines Herstellers, damit die Wartung/Fehlerbehebung einfach ist. |
| | 19. | Our leaders are provided with a stable internet connection for their work locations/times. | Unseren Führungskräften steht eine stabile Internetverbindung für ihre Arbeitsorte/-zeiten zur Verfügung. |
| | 20. | Our leaders have access to a very good internet speed (upload/download) for their work locations/times. | Unseren Führungskräften steht eine für deren Zwecke sehr gute Internetgeschwindigkeit (Upload/Download) für ihre Arbeitsorte/-zeiten zur Verfügung. |
| | 21. | Our company provides leaders with a stable mobile network for their work locations/times. | Unser Unternehmen stellt Führungskräften ein stabiles Mobilfunknetz für ihre Arbeitsorte/-zeiten zur Verfügung. |

| | | | |
|--|-----|---|---|
| C. Competent use of virtual media C. Kompetente Anwendung virtueller Medien | 22. | Our leaders are well organized in terms of virtual communication. | Unsere Führungskräfte sind hinsichtlich der virtuellen Kommunikation gut organisiert. |
| | 23. | Our leaders are aware that misleading communication can result from a lack of gestures/facial expressions (e.g., on the phone/in emails). | Unseren Führungskräften ist bewusst, dass missverständliche Kommunikation durch fehlende Gestik/Mimik (z. B. am Telefon/in E-Mails) entstehen kann. |
| | 24. | Our leaders use a variety of virtual communication methods. | Unsere Führungskräfte nutzen eine Vielzahl von virtuellen Kommunikationsmethoden. |
| | 25. | Our leaders combine a variety of communication methods in a meaningful way. | Unsere Führungskräfte kombinieren eine Vielzahl von Kommunikationsmethoden sinnvoll. |
| | 26. | The virtual communication methods used by our leaders contribute to good communication and collaboration. | Die von unseren Führungskräften genutzten virtuellen Kommunikationsmethoden tragen zu guter Kommunikation und Zusammenarbeit bei. |
| | 27. | Our leaders handle various types of technology failures in a goal-oriented manner. | Unsere Führungskräfte gehen mit verschiedenen Arten von Technologieausfällen zielführend um. |
| | 28. | Our leaders act securely in a virtual environment, so that cybersecurity is enforced. | Unsere Führungskräfte agieren virtuell sicher, sodass Cybersicherheit forciert wird. |
| | 29. | Our leaders use virtual media within its capabilities and limitations. | Unsere Führungskräfte nutzen virtuelle Medien im Rahmen der Möglichkeiten und Grenzen der virtuellen Medien. |
| | 30. | Our leaders use virtual media appropriately for the task at hand. | Unsere Führungskräfte setzen virtuelle Medien aufgabengerecht ein. |
| | 31. | Our leaders use virtual media in a goal-oriented manner. | Unsere Führungskräfte gehen mit virtuellen Medien zielgerichtet um. |

| | | | |
|--|-----|---|--|
| | 32. | Our leaders transmit nonverbal signals through virtual media. | Unsere Führungskräfte übertragen nonverbale Signale über virtuelle Medien. |
| | 33. | Our leaders transmit emotions through virtual media. | Unsere Führungskräfte übertragen Emotionen über virtuelle Medien. |
| | 34. | Our leaders communicate clearly and concisely virtually. | Unsere Führungskräfte kommunizieren virtuell klar und deutlich. |



Appendix IX: Analysis of association between items and intended dimension (pretest of substantive validity)

| Dimension | No. | English item | German item | Assignment of an item to the intended dimension | | | | | | |
|--|-----|--|--|---|-------|-----|----------|----------|----------------|----------------------------|
| | | | | n_e | n_o | N | p_{sa} | c_{sv} | \bar{c}_{sv} | $c_{sv} \geq \bar{c}_{sv}$ |
| A. The provided hardware and software is actually used | 1 | Our leaders use laptops to communicate with employees. | Unsere Führungskräfte nutzen Laptops für die Kommunikation mit Mitarbeitenden. | 10 | 4 | 13 | .77 | .46 | .54 | ✗ |
| | 2 | Our leaders use smartphones/cell phones to communicate with employees. | Unsere Führungskräfte nutzen Smartphones/Handys für die Kommunikation mit Mitarbeitenden. | 7 | 6 | 13 | .54 | .08 | .54 | ✗ |
| | 3 | Our leaders use tablets to communicate with employees. | Unsere Führungskräfte nutzen Tablets für die Kommunikation mit Mitarbeitenden. | 7 | 5 | 13 | .54 | .15 | .54 | ✗ |
| | 4 | Our leaders access and use our company's (virtual) networks (e.g., cloud or VPN) from various locations. | Unsere Führungskräfte greifen von verschiedenen Orten auf (virtuelle) Netzwerke (z. B. Cloud oder VPN) unseres Unternehmens zu und nutzen diese. | 4 | 7 | 13 | .31 | -.23 | .54 | ✗ |
| | 5 | Our leaders use video conferencing to communicate with employees. | Unsere Führungskräfte nutzen Videokonferenzen für die Kommunikation mit Mitarbeitenden. | 3 | 7 | 13 | .23 | -.31 | .54 | ✗ |
| | 6 | Our leaders use telephone conferences to communicate with employees. | Unsere Führungskräfte nutzen Telefonkonferenzen für die Kommunikation mit Mitarbeitenden. | 1 | 8 | 13 | .08 | -.54 | .54 | ✗ |
| | 7 | Our leaders send emails to communicate with employees. | Unsere Führungskräfte senden E-Mails für die Kommunikation mit Mitarbeitenden. | 4 | 6 | 13 | .31 | -.15 | .54 | ✗ |
| | 8 | Our leaders use chat (e.g., messenger services) to communicate with employees. | Unsere Führungskräfte nutzen Chats (z. B. Messenger-Dienste) für die Kommunikation mit Mitarbeitenden. | 6 | 6 | 13 | .46 | .00 | .54 | ✗ |
| | 9 | Our leaders use SMS to communicate with employees. | Unsere Führungskräfte nutzen SMS für die Kommunikation mit Mitarbeitenden. | 6 | 3 | 12 | .50 | .25 | .67 | ✗ |
| | 10 | Our leaders share their calendars, including appointment content, with employees. | Unsere Führungskräfte teilen ihre Kalender inkl. der Termininhalte mit den Mitarbeitenden. | 2 | 10 | 13 | .15 | -.62 | .54 | ✗ |
| | 11 | Our leaders use digital repositories (digital folder structures/databases) to share documents. | Unsere Führungskräfte nutzen digitale Ablagen (digitale Ordnerstrukturen/Datenbanken) für den Austausch von Dokumenten. | 3 | 8 | 13 | .23 | -.38 | .54 | ✗ |
| | 12 | Our leaders use collaboration software (e.g. Teams or Confluence). | Unsere Führungskräfte nutzen Kollaborationssoftware (z. B. Teams oder Confluence). | 1 | 8 | 13 | .08 | -.54 | .54 | ✗ |
| | 13 | Our leaders use wikis to store, develop and make knowledge available. | Unsere Führungskräfte setzen Wikis ein, um Wissen zu speichern, weiterzuentwickeln und verfügbar zu machen. | 2 | 8 | 13 | .15 | -.46 | .54 | ✗ |
| | 14 | Our leaders use recorded video to make information accessible to employees regardless of time or location. | Unsere Führungskräfte nutzen aufgezeichnete Videos, um Mitarbeitenden zeitunabhängig Informationen zugänglich zu machen. | 2 | 7 | 12 | .17 | -.42 | .67 | ✗ |
| | 15 | Our leaders use an intranet to make information available to employees. | Unsere Führungskräfte nutzen ein Intranet, um Mitarbeitenden Informationen zur Verfügung zu stellen. | 2 | 8 | 13 | .15 | -.46 | .54 | ✗ |
| | 16 | Our leaders use internal company social media to communicate with (and among) employees. | Unsere Führungskräfte nutzen unternehmensinterne soziale Medien, um mit (und unter) Mitarbeitenden zu kommunizieren. | 1 | 6 | 13 | .08 | -.38 | .54 | ✗ |
| | 17 | Our leaders enable virtual informal communication apart from the work task (e.g. virtual coffee kitchen). | Unsere Führungskräfte ermöglichen virtuell informelle Kommunikation abseits der Arbeitsaufgabe (z. B. virtuelle Kaffeeküche). | 2 | 6 | 12 | .17 | -.33 | .67 | ✗ |

| Dimension | No. | English item | German item | Assignment of an item to the intended dimension | | | | | | | | |
|--|-----|--|---|---|-------------|----------------|-------|-----|----------|----------|----------------|----------------------------|
| | | | | \bar{c}_{sv} | \bar{r}_c | \bar{c}_{sv} | n_o | N | p_{sa} | c_{sv} | \bar{c}_{sv} | $c_{sv} \geq \bar{c}_{sv}$ |
| B. (Organizational) support to ensure the ability to work | 18 | Our leaders use mostly one manufacturer's hardware so maintenance/troubleshooting is easy. | Unsere Führungskräfte nutzen überwiegend Hardware eines Herstellers, damit die Wartung/Fehlerbehebung einfach ist. | 5 | | 7 | 12 | .42 | -.17 | .67 | ✗ | |
| | 19 | Our leaders are provided with a stable internet connection for their work locations/times. | Unsere Führungskräfte steht eine stabile Internetverbindung für ihre Arbeitsorte/-zeiten zur Verfügung. | 8 | | 4 | 13 | .62 | .31 | .54 | ✗ | |
| | 20 | Our leaders have access to a very good internet speed (upload/download) for their work locations/times. | Unsere Führungskräfte steht eine für deren Zwecke sehr gute Internetgeschwindigkeit (Upload/Download) für ihre Arbeitsorte/-zeiten zur Verfügung. | 9 | | 3 | 13 | .69 | .46 | .54 | ✗ | |
| | 21 | Our company provides leaders with a stable mobile network for their work locations/times. | Unser Unternehmen stellt Führungskräften ein stabiles Mobilfunknetz für ihre Arbeitsorte/-zeiten zur Verfügung. | 8 | | 3 | 12 | .67 | .42 | .67 | ✗ | |
| C. The virtual media are used competently | 22 | Our leaders are well organized in terms of virtual communication. | Unsere Führungskräfte sind hinsichtlich der virtuellen Kommunikation gut organisiert. | 6 | | 4 | 13 | .46 | .15 | .54 | ✗ | |
| | 23 | Our leaders are aware that misleading communication can result from a lack of gestures/facial expressions (e.g., on the phone/in e-mails). | Unsere Führungskräfte ist bewusst, dass missverständliche Kommunikation durch fehlende Gestik/Mimik (z. B. am Telefon/in E-Mails) entstehen kann. | 11 | | 1 | 13 | .85 | .77 | .54 | ✓ | |
| | 24 | Our leaders use a variety of virtual communication methods. | Unsere Führungskräfte nutzen eine Vielzahl von virtuellen Kommunikationsmethoden | 7 | | 4 | 13 | .54 | .23 | .54 | ✗ | |
| | 25 | Our leaders combine a variety of communication methods in a meaningful way. | Unsere Führungskräfte kombinieren eine Vielzahl von Kommunikationsmethoden sinnvoll. | 10 | | 3 | 13 | .77 | .54 | .54 | ✓ | |
| | 26 | The virtual communication methods used by our leaders contribute to good communication and collaboration. | Die von unseren Führungskräften genutzten virtuellen Kommunikationsmethoden tragen zu guter Kommunikation und Zusammenarbeit bei. | 10 | | 3 | 13 | .77 | .54 | .54 | ✓ | |
| | 27 | Our leaders handle various types of technology failures in a goal-oriented manner. | Unsere Führungskräfte gehen mit verschiedenen Arten von Technologieausfällen zielführend um. | 5 | | 4 | 12 | .42 | .08 | .67 | ✗ | |
| | 28 | Our leaders act securely in a virtual environment, so that cybersecurity is enforced. | Unsere Führungskräfte agieren virtuell sicher, sodass Cybersicherheit forciert wird. | 5 | | 5 | 13 | .38 | .00 | .54 | ✗ | |
| | 29 | Our leaders use virtual media within its capabilities and limitations. | Unsere Führungskräfte nutzen virtuelle Medien im Rahmen der Möglichkeiten und Grenzen der virtuellen Medien. | 6 | | 5 | 13 | .46 | .08 | .54 | ✗ | |
| | 30 | Our leaders use virtual media appropriately for the task at hand. | Unsere Führungskräfte setzen virtuelle Medien aufgabengerecht ein. | 7 | | 4 | 12 | .58 | .25 | .67 | ✗ | |
| | 31 | Our leaders use virtual media in a goal-oriented manner. | Unsere Führungskräfte gehen mit virtuellen Medien zielgerichtet um. | 8 | | 3 | 13 | .62 | .38 | .54 | ✗ | |
| | 32 | Our leaders transmit nonverbal signals through virtual media. | Unsere Führungskräfte übertragen nonverbale Signale über virtuelle Medien. | 9 | | 2 | 12 | .75 | .58 | .67 | ✗ | |
| | 33 | Our leaders transmit emotions through virtual media. | Unsere Führungskräfte übertragen Emotionen über virtuelle Medien. | 9 | | 2 | 12 | .75 | .58 | .67 | ✗ | |
| | 34 | Our leaders communicate clearly and concisely virtually. | Unsere Führungskräfte kommunizieren virtuell klar und deutlich. | 8 | | 3 | 13 | .62 | .38 | .54 | ✗ | |
| Descriptive statistics | | | Mean | | | | | | .45 | .05 | | |
| | | | Median | | | | | | .46 | .08 | | |
| | | | Standard deviation | | | | | | .24 | .40 | | |
| Descriptive statistics after elimination of items with $c_{sv} < 0.01$ (no. 16, 17, 23, 26, 32 and 33) | | | Mean | | | | | | .43 | .00 | | |
| | | | Median | | | | | | .46 | .08 | | |
| | | | Standard deviation | | | | | | .21 | .36 | | |

Appendix X: SPSS output of the EFA – Factor matrix

| Item | Factor | |
|---------|--------|-------|
| | 1 | 2 |
| TVAL_31 | .888 | -.272 |
| TVAL_30 | .828 | -.112 |
| TVAL_29 | .817 | -.175 |
| TVAL_34 | .811 | .012 |
| TVAL_22 | .781 | .029 |
| TVAL_25 | .779 | -.033 |
| TVAL_24 | .764 | .093 |
| TVAL_27 | .715 | -.324 |
| TVAL_28 | .711 | -.165 |
| TVAL_04 | .679 | .521 |
| TVAL_11 | .643 | .253 |
| TVAL_12 | .628 | .150 |
| TVAL_05 | .621 | .245 |
| TVAL_01 | .576 | .535 |
| TVAL_13 | .526 | -.159 |
| TVAL_10 | .457 | -.080 |
| TVAL_08 | .457 | -.147 |
| TVAL_14 | .407 | -.084 |
| TVAL_15 | .367 | -.092 |
| TVAL_06 | .367 | .176 |
| TVAL_02 | .362 | .193 |
| TVAL_21 | .357 | .296 |
| TVAL_07 | .314 | .286 |
| TVAL_18 | .228 | .157 |
| TVAL_03 | .218 | .123 |
| TVAL_20 | .244 | .340 |
| TVAL_19 | .261 | .266 |
| TVAL_09 | -.042 | .053 |

Extraction Method: Maximum

a. 2 factors extracted. 9 iterations

Appendix XI: SPSS output of the EFA – Total variance explained

| Factor | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|--|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| | | | | | | | | | |
| 1 | 9.876 | 35.272 | 35.272 | 9.318 | 33.280 | 33.280 | 6.247 | 22.310 | 22.310 |
| 2 | 2.348 | 8.386 | 43.658 | 1.499 | 5.352 | 38.632 | 4.570 | 16.321 | 38.632 |
| 3 | 1.704 | 6.086 | 49.744 | | | | | | |
| 4 | 1.525 | 5.445 | 55.190 | | | | | | |
| 5 | 1.331 | 4.752 | 59.942 | | | | | | |
| 6 | 1.110 | 3.964 | 63.906 | | | | | | |
| 7 | 1.061 | 3.790 | 67.696 | | | | | | |
| 8 | .939 | 3.355 | 71.050 | | | | | | |
| 9 | .900 | 3.213 | 74.263 | | | | | | |
| 10 | .807 | 2.884 | 77.147 | | | | | | |
| 11 | .698 | 2.491 | 79.638 | | | | | | |
| 12 | .667 | 2.381 | 82.019 | | | | | | |
| 13 | .627 | 2.239 | 84.258 | | | | | | |
| 14 | .597 | 2.131 | 86.390 | | | | | | |
| 15 | .467 | 1.666 | 88.056 | | | | | | |
| 16 | .444 | 1.584 | 89.640 | | | | | | |
| 17 | .424 | 1.514 | 91.154 | | | | | | |
| 18 | .381 | 1.360 | 92.514 | | | | | | |
| 19 | .341 | 1.219 | 93.733 | | | | | | |
| 20 | .316 | 1.129 | 94.862 | | | | | | |
| 21 | .290 | 1.037 | 95.899 | | | | | | |
| 22 | .249 | .891 | 96.790 | | | | | | |
| 23 | .214 | .763 | 97.553 | | | | | | |
| 24 | .181 | .645 | 98.198 | | | | | | |
| 25 | .165 | .590 | 98.788 | | | | | | |
| 26 | .137 | .489 | 99.277 | | | | | | |
| 27 | .116 | .416 | 99.693 | | | | | | |
| 28 | .086 | .307 | 100.000 | | | | | | |
| Extraction Method: Maximum Likelihood. | | | | | | | | | |

Appendix XII: SPSS output of the EFA – Rotated factor matrix

| Item | Description | Rotated factor loadings | |
|----------|--|-------------------------|------|
| | | 1 | 2 |
| TVAL_31 | Our leaders use virtual media in a goal-oriented manner. | .886 | .278 |
| TVAL_27 | Our leaders handle various types of technology failures in a goal-oriented manner. | .773 | .138 |
| TVAL_29* | Our leaders use virtual media within its capabilities and limitations. | .772 | .318 |
| TVAL_30* | Our leaders use virtual media appropriately for the task at hand. | .746 | .376 |
| TVAL_28 | Our leaders act securely in a virtual environment, so that cybersecurity is enforced. | .680 | .266 |
| TVAL_34 | Our leaders communicate clearly and concisely virtually. | .662 | .469 |
| TVAL_25 | Our leaders combine a variety of communication methods in a meaningful way. | .661 | .413 |
| TVAL_22 | Our leaders are well organized in terms of virtual communication. | .628 | .466 |
| TVAL_24 | Our leaders use a variety of virtual communication methods. | .577 | .509 |
| TVAL_13 | Our leaders use wikis to store, develop and make knowledge available. | .524 | .166 |
| TVAL_08 | Our leaders use chat (e.g., messenger services) to communicate with employees. | .460 | .137 |
| TVAL_10 | Our leaders share their calendars, including appointment content, with employees. | .422 | .193 |
| TVAL_14 | Our leaders use recorded video to make information accessible to employees regardless of time or location. | .383 | .161 |
| TVAL_15 | Our leaders use an intranet to make information available to employees. | .355 | .132 |

| | | | |
|---------------|--|--------|-------------|
| TVAL_09 | Our leaders use SMS to communicate with employees. | -.065 | .020 |
| TVAL_04 | Our leaders access and use our company's (virtual) networks (e.g., cloud or VPN) from various locations. | .265 | .814 |
| TVAL_01 | Our leaders use laptops to communicate with employees. | .173 | .767 |
| TVAL_11* | Our leaders use digital repositories (digital folder structures/databases) to share documents. | .387 | .572 |
| TVAL_05* | Our leaders use video conferencing to communicate with employees. | .373 | .554 |
| TVAL_12 | Our leaders use collaboration software (e.g., Teams or Confluence). | .434 | .479 |
| TVAL_21 | Our company provides leaders with a stable mobile network for their work locations/times. | .126 | .446 |
| TVAL_20 | Our leaders have access to a very good internet speed (upload/download) for their work locations/times. | .009 | .418 |
| TVAL_07 | Our leaders send emails to communicate with employees. | .097 | .413 |
| TVAL_19 | Our leaders are provided with a stable internet connection for their work locations/times. | .065 | .367 |
| TVAL_02 | Our leaders use smartphones/cell phones to communicate with employees. | .189 | .364 |
| TVAL_06 | Our leaders use telephone conferences to communicate with employees. | .203 | .353 |
| TVAL_18 | Our leaders use mostly one manufacturer's hardware so maintenance/troubleshooting is easy. | .099 | .259 |
| TVAL_03 | Our leaders use tablets to communicate with employees. | .111 | .225 |
| Eigenvalues | | 6.247 | 4.570 |
| % of variance | | 22.310 | 16.321 |

Appendix XIII: SPSS output of the EFA – Final EFA results incl. Cronbach's alpha values

| Item | Description | Rotated factor loadings | |
|----------|--|-------------------------|-------------|
| | | 1 | 2 |
| TVAL_31 | Our leaders use virtual media in a goal-oriented manner. | .886 | .278 |
| TVAL_27 | Our leaders handle various types of technology failures in a goal-oriented manner. | .773 | .138 |
| TVAL_29* | Our leaders use virtual media within its capabilities and limitations. | .772 | .318 |
| TVAL_30* | Our leaders use virtual media appropriately for the task at hand. | .746 | .376 |
| TVAL_28 | Our leaders act securely in a virtual environment, so that cybersecurity is enforced. | .680 | .266 |
| TVAL_13 | Our leaders use wikis to store, develop and make knowledge available. | .524 | .166 |
| TVAL_08 | Our leaders use chat (e.g., messenger services) to communicate with employees. | .460 | .137 |
| TVAL_15 | Our leaders use an intranet to make information available to employees. | .355 | .132 |
| TVAL_04 | Our leaders access and use our company's (virtual) networks (e.g., cloud or VPN) from various locations. | .265 | .814 |
| TVAL_01 | Our leaders use laptops to communicate with employees. | .173 | .767 |
| TVAL_11* | Our leaders use digital repositories (digital folder structures/databases) to share documents. | .387 | .572 |
| TVAL_05* | Our leaders use video conferencing to communicate with employees. | .373 | .554 |
| TVAL_21 | Our company provides leaders with a stable mobile network for their work locations/times. | .126 | .446 |

| | | | |
|-------------------|---|------|-------------|
| TVAL_20 | Our leaders have access to a very good internet speed (upload/download) for their work locations/times. | .009 | .418 |
| TVAL_19 | Our leaders are provided with a stable internet connection for their work locations/times. | .065 | .367 |
| Cronbach's alpha: | | .860 | .795 |



Appendix XIV: Scales used for SEM

| Firm-level employee performance (Ketkar and Sett, 2009, p. 1038) | |
|--|---|
| Please rate the following criteria for your company's employees based on the last 12 months. Bitte bewerten Sie die folgenden Kriterien für die Mitarbeiter Ihres Unternehmens bezogen auf die letzten 12 Monate. | |
| Customer orientation | Kundenorientierung |
| Quality consciousness | Qualitätsbewusstsein |
| Cost/efficiency consciousness | Kosten-/Effizienzbewusstsein |
| Team orientation | Teamorientierung |
| Organisational commitment | Bindung an das Unternehmen (Commitment) |
| Willingness to change | Veränderungsbereitschaft |
| Willingness to learn | Lernbereitschaft |
| Problem-solving skill | Problemlösungskompetenz |
| Ability to handle multiple types of tasks | Fähigkeit, unterschiedliche Aufgabenarten zu bewältigen |
| Output per employee | Output pro Mitarbeiter (z. B. Ausbringungsmenge) |

| Operational performance (Ketkar and Sett, 2009, p. 1038) | |
|--|--|
| Please rate the following operational performance criteria for your company based on the last 12 months. Bitte bewerten Sie die folgenden betrieblichen Leistungskriterien für Ihr Unternehmen bezogen auf die letzten 12 Monate. | |
| Customer satisfaction level | Grad der Kundenzufriedenheit |
| Product/service quality | Qualität von Produkten/Dienstleistungen |
| Efficiency of operations | Effizienz der Betriebsabläufe |
| Employee productivity | Mitarbeiterproduktivität |
| Ability to meet customer needs in terms of quality, cost and delivery schedule | Fähigkeit, Kundenbedürfnisse hinsichtlich Qualität, Kosten und Lieferfrist zu erfüllen |
| Rate of new product/service development | |

| | |
|--|---|
| Successful launch of new product/service | Anteil der Neuentwicklung von Produkten/Dienstleistungen |
| Time to develop a new product/service | |
| Ability to retain existing customers | Erfolgreiche Einführung neuer Produkte/Dienstleistungen |
| Ability to attract new customers | Dauer der Entwicklung eines neuen Produkts/einer neuen Dienstleistung |
| | Fähigkeit, Kunden zu halten |
| | Fähigkeit, neue Kunden zu gewinnen |

| Financial performance (Ketkar and Sett, 2009, p. 1038) | |
|--|--|
| Please rate your company's average financial performance compared to the industry average over the past 12 months. Bitte bewerten Sie die durchschnittliche finanzielle Leistung Ihres Unternehmens im Vergleich zum Branchendurchschnitt in den letzten 12 Monate. | |
| Growth of sales revenue | Steigerung der Umsatzerlöse |
| Profitability (profit/sales) | Rentabilität (Gewinn/Umsatz) |
| Operating cost efficiency (total cost/sales) | Effizienz der Betriebskosten (Gesamtkosten/Umsatz) |
| Growth of market share | Wachstum des Marktanteils |
| Overall firm performance | Gesamtleistung des Unternehmens |

| Internal numerical flexibility (Poethke et al., 2019, p. 138) | |
|---|---|
| Please answer the following statements about flexibility in relation to your company. Bitte beantworten Sie die folgenden Aussagen zur Flexibilität bezogen auf Ihr Unternehmen. Seven-point Likert scale with labeled extrema (0 = strongly disagree, 6 = strongly agree) and “cannot answer” option | |
| The employees of our company can organize their working hours flexibly. | Die Mitarbeiter in unserem Unternehmen können die Arbeitszeit flexibel einteilen. |
| The employees of our company work from home on a regular basis. | Die Mitarbeiter in unserem Unternehmen arbeiten regelmäßig im Homeoffice. |

| | |
|---|--|
| <p>The employees of our company reply to work emails even when they are not in the office (e.g., on the road, on the train, at the customer, at home).</p> <p>The employer does not set a fixed start time for the workday of the employees (e.g., flexible working hours).</p> <p>During their normal working hours, employees regularly work outside of the office (e.g., on the road, on the train, at the customer, at home).</p> | <p>Die Mitarbeiter in unserem Unternehmen beantworten berufliche E-Mails auch außerhalb des Büros (z. B. von unterwegs, im Zug, beim Kunden, Zuhause).</p> <p>Vom Arbeitgeber wird kein fester Beginn des Arbeitstages für die Mitarbeiter des Unternehmens festgelegt (z. B. durch Gleitzeit).</p> <p>Die Mitarbeiter in unserem Unternehmen arbeiten während ihrer regulären Arbeitszeit regelmäßig außerhalb des Büros (z. B. von unterwegs, im Zug, beim Kunden, Zuhause).</p> |
|---|--|

| External numerical flexibility (Martínez-Sánchez, Vela-Jiménez et al., 2008, p. 654) | |
|--|--|
| <p>In our company, we use the following instruments regularly and extensively to be flexible with regard to the size of the workforce:</p> <p>In unserem Unternehmen nutzen wir folgende Instrumente regelmäßig und umfangreich, um hinsichtlich der Größe der Belegschaft flexibel zu sein:</p> <p>Seven-point Likert scale with labeled extrema (0 = strongly disagree, 6 = strongly agree) and “cannot answer” option</p> | |
| Temporary employees Fixed-term employees Layoffs | Zeitarbeitskräfte Befristete Verträge für Mitarbeiter Entlassungen |

| Functional numerical flexibility (Martínez-Sánchez, Vela-Jiménez et al., 2008, p. 654) | |
|--|---|
| Please evaluate the following statements in relation to your company. Bitte bewerten Sie die folgenden Aussagen bezogen auf Ihr Unternehmen. Seven-point Likert scale with labeled extrema (0 = strongly disagree, 6 = strongly agree) and “cannot answer” option | |
| Job rotation Multi-skilled teams Total quality management Quality and problem-solving teams Employees involvement in job design and planning | Unser Unternehmen setzt regelmäßige Arbeitsplatzwechsel (Job Rotation) in großem Umfang ein. Unser Unternehmen legt großen Wert auf die Zusammenarbeit in Teams mit vielseitig qualifizierten Mitarbeitern. Unser Unternehmen setzt ein umfassendes Qualitätsmanagement (Total Quality Management) in großem Umfang ein. Unser Unternehmen setzt Qualitäts- und Problemlösungsteams in großem Umfang ein. Unser Unternehmen bezieht die Mitarbeiter in die Arbeitsgestaltung und -planung in großem Umfang ein. |

| Procedural flexibility (Colvin, 2006, p. 86) | |
|---|--|
| Please rate the following statements regarding influence in your company. Bitte bewerten Sie die folgenden Aussagen bzgl. der Einflussnahme in Ihrem Unternehmen. Seven-point Likert scale with labeled extrema (0 = strongly disagree, 6 = strongly agree) and “cannot answer” option | |
| Managers have the freedom to hire the person they want for a job We can take a chance in hiring a new employee, since if they do not work out it is | Führungskräfte haben die Freiheit, eine selbstgewählte Person für einen Job einzustellen. Unser Unternehmen kann das Risiko eingehen, einen neuen Mitarbeiter einzustellen, |

| | |
|--|--|
| <p>relatively easy to terminate their employment</p> <p>A lot of time is involved in reaching and carrying out a decision to fire an employee (reverse coded)</p> <p>We usually require an extensive record of inadequate performance before an employee is fired because of poor job performance (reverse coded)</p> <p>In our company we use a non-union grievance procedure</p> | <p>denn wenn er in seiner Funktion nicht gut ist, ist es relativ einfach, das Arbeitsverhältnis zu beenden.</p> <p>Es braucht viel Zeit, um eine Entscheidung über die Entlassung eines Mitarbeiters zu treffen und umzusetzen.</p> <p>In unserem Unternehmen benötigen wir in der Regel eine umfangreiche Aufzeichnung unzureichender Leistungen, bevor ein Mitarbeiter wegen schlechter Arbeitsleistung entlassen wird.</p> <p>In unserem Unternehmen nutzen wir ein nicht gewerkschaftlich organisiertes Beschwerdeverfahren.</p> |
|--|--|

| <p>Cost flexibility</p> <p>(Whyman and Petrescu, 2015, p. 1125)</p> | |
|--|---|
| <p>In our company, we use the following instruments regularly and extensively in order to be flexible with regard to costs:</p> <p>In unserem Unternehmen nutzen wir folgende Instrumente regelmäßig und umfangreich, um hinsichtlich der Kosten flexibel zu sein:</p> <p>Seven-point Likert scale with labeled extrema (0 = strongly disagree, 6 = strongly agree) and “cannot answer” option</p> | |
| <p>Management pay-cut</p> <p>Management voluntarily forgo bonus</p> <p>Commission pay</p> <p>Individual performance-related pay</p> <p>Profit-related pay</p> | <p>Gehaltskürzung für das Management</p> <p>Management verzichtet freiwillig auf Bonus</p> <p>Provisionszahlung</p> <p>Individuelle leistungsbezogene Vergütung</p> <p>Unternehmensgewinnbezogene Bezahlung</p> |

| Transformational leadership climate (Oberfield, 2014, p. 418) | |
|---|--|
| Bitte beantworten Sie die folgenden Aussagen zur Führung bezogen auf Ihr Unternehmen. Please answer the following statements about leadership as they relate to your company. Seven-point Likert scale with labeled extrema (0 = strongly disagree, 6 = strongly agree) and “cannot answer” option | |
| My organization’s leaders maintain high standards of honesty and integrity In my organization, leaders generate high levels of motivation and commitment in the workforce Employees have a feeling of personal empowerment and ownership of work processes I feel encouraged to come up with new and better ways of doing things | Die Führungskräfte unseres Unternehmens zeigen ein hohes Niveau in Bezug auf Ehrlichkeit und Integrität. In unserem Unternehmen generieren die Führungskräfte ein hohes Maß an Motivation und Engagement innerhalb der Belegschaft. Die Mitarbeiter unseres Unternehmens fühlen sich persönlich gestärkt und haben ein Gefühl der Eigenverantwortung für Arbeitsprozesse. Die Mitarbeiter unseres Unternehmens fühlen sich ermutigt, neue und bessere Wege zu finden, Dinge zu erledigen. |

| Trust (Robinson and Rousseau, 1994, p. 251) | |
|---|--|
| Please answer the following statements about trust related to your company. Bitte beantworten Sie die folgenden Aussagen zum Vertrauen bezogen auf Ihr Unternehmen. Seven-point Likert scale with labeled extrema (0 = strongly disagree, 6 = strongly agree) and “cannot answer” option | |
| I am not sure I fully trust my employer (reverse score). My employer is open and up-front with me. I believe my employer has high integrity. In general, I believe my employer's motives and intentions are good. | Ich bin mir nicht sicher, ob unsere Mitarbeiter unserem Arbeitgeber voll vertrauen. Ich denke, dass unser Arbeitgeber unsere Mitarbeiter gerecht behandelt. Ich denke, unser Arbeitgeber hat eine hohe Integrität. |

| | |
|---|--|
| <p>My employer is not always honest and truthful (reverse score).</p> <p>I don't think my employer treats me fairly (reverse score).</p> <p>I can expect my employer to treat me in a consistent and predictable fashion.</p> | <p>Im Allgemeinen halte ich die Beweggründe und Absichten unseres Arbeitgebers für gut.</p> <p>Unser Arbeitgeber ist nicht immer ehrlich.</p> <p>Ich denke, dass unser Arbeitgeber unsere Mitarbeiter gerecht behandelt.</p> <p>Ich kann damit rechnen, dass unser Arbeitgeber sich Mitarbeitern gegenüber konsistent (gleichbleibend) und vorhersehbar verhält.</p> |
|---|--|

| Technological requirements of virtual leadership (own development) | |
|--|--|
| <p>Please answer the following statements about the technological requirements of virtual leadership in relation to your company.</p> <p>Bitte beantworten Sie die folgenden Aussagen zu den technologischen Aspekte virtueller Führung bezogen auf Ihr Unternehmen.</p> <p>Seven-point Likert scale with labeled extrema (0 = strongly disagree, 6 = strongly agree) and “cannot answer” option</p> | |
| <p>Our leaders use virtual media suited to the specific tasks.</p> <p>Our leaders deal with different types of technological failures in a goal-driven manner.</p> <p>Our leaders use virtual media in line with the possibilities and limitations of virtual media.</p> <p>Our leaders operate confidently in a virtual environment to ensure cyber security.</p> <p>Our leaders use wikis to store knowledge, develop it further and make it available.</p> <p>Our leaders use chats (e.g., messenger services) to communicate with employees.</p> | <p>Unsere Führungskräfte setzen virtuelle Medien aufgabengerecht ein.</p> <p>Unsere Führungskräfte gehen mit verschiedenen Arten von Technologieausfällen zielführend um.</p> <p>Unsere Führungskräfte nutzen virtuelle Medien im Rahmen der Möglichkeiten und Grenzen der virtuellen Medien.</p> <p>Unsere Führungskräfte agieren virtuell sicher, sodass Cybersicherheit forciert wird.</p> <p>Unsere Führungskräfte setzen Wikis ein, um Wissen zu speichern, weiterzuentwickeln und verfügbar zu machen.</p> |

| | |
|--|---|
| <p>Our leaders use an intranet to provide employees with information.</p> <p>Our leaders access our company's (virtual) networks (e.g., cloud or VPN) from different locations and use them.</p> <p>Our leaders use laptops to communicate with employees.</p> <p>Our leaders use digital filing systems (digital folder structures/databases) to exchange documents.</p> <p>Our leaders use video conferences to communicate with employees.</p> <p>Our company provides leaders with a stable cellular network at their work locations/during their working hours.</p> <p>Our leaders have access to an excellent internet connection (upload/download) suitable for their purposes at their work locations/during their working hours.</p> <p>Our leaders have access to stable internet connection at their work locations/during their working hours.</p> | <p>Unsere Führungskräfte nutzen Chats (z. B. Messenger-Dienste) für die Kommunikation mit Mitarbeitenden.</p> <p>Unsere Führungskräfte nutzen ein Intranet, um Mitarbeitenden Informationen zur Verfügung zu stellen.</p> <p>Unsere Führungskräfte greifen von verschiedenen Orten auf (virtuelle) Netzwerke (z. B. Cloud oder VPN) unseres Unternehmens zu und nutzen diese.</p> <p>Unsere Führungskräfte nutzen Laptops für die Kommunikation mit Mitarbeitenden.</p> <p>Unsere Führungskräfte nutzen digitale Ablagen (digitale Ordnerstrukturen/Datenbanken) für den Austausch von Dokumenten.</p> <p>Unsere Führungskräfte nutzen Videokonferenzen für die Kommunikation mit Mitarbeitenden.</p> <p>Unser Unternehmen stellt Führungskräften ein stabiles Mobilfunknetz für ihre Arbeitsorte/-zeiten zur Verfügung.</p> <p>Unseren Führungskräften steht eine für ihre Zwecke sehr gute Internetgeschwindigkeit (Upload/Download) für ihre Arbeitsorte/-zeiten zur Verfügung.</p> <p>Unseren Führungskräften steht eine stabile Internetverbindung für ihre Arbeitsorte/-zeiten zur Verfügung.</p> |
|--|---|

| HR commitment practices (Martínez-Sánchez, Pérez-Pérez et al., 2008, p. 21) | |
|---|---|
| Please rate how many employees in your company the following statements apply to. Bitte bewerten Sie auf wie viele Mitarbeiter Ihres Unternehmens die folgenden Aussagen zutreffen. Seven-point Likert scale with labeled extrema (0 = very few employees, 6 = all employees) and “cannot answer” option | |
| We provide training focused on team building, teamwork skills and new information technologies We provide multiple career path opportunities for employees to move across multiple functional areas of the firm Management allows employees to be highly autonomous and to regulate their own behaviour We ensure that employees are made aware of internal promotion opportunities All staff are informed about the firm strategy and the market position and competitive pressures faced by the firm Employees are encouraged to suggest improvements and are formally acknowledged and compensated by their performance | Wir bieten Schulungen an, die sich auf Teambildung, Teamarbeit und neue Informationstechnologien konzentrieren. Wir bieten zahlreiche Karrieremöglichkeiten für Mitarbeiter, die sich in verschiedenen Funktionsbereichen des Unternehmens bewegen. Das Management ermöglicht den Mitarbeitern ein hohes Maß an Autonomie und die Regulierung ihres eigenen Verhaltens. Wir sorgen dafür, dass die Mitarbeiter auf interne Aufstiegsmöglichkeiten aufmerksam gemacht werden. Alle Mitarbeiter sind über die Unternehmensstrategie, die Marktposition und den Wettbewerbsdruck, dem das Unternehmen ausgesetzt ist, informiert. Die Mitarbeiter werden ermutigt, Verbesserungsvorschläge zu machen, und sie erhalten eine förmliche Anerkennung und Entlohnung für ihre Leistung. |

| Control variables | |
|--|--|
| The questions concerning control variables are formulated as follows: | |
| <p>How many full-time employees (absolute) are employed in your company? Part-time employees are counted on a pro-rata basis. Please provide as accurate an estimate as possible.</p> <p>Please estimate the employee turnover rate in your company in the last 12 months in %.</p> <p>What was the turnover rate in your company compared to other companies in your industry in the last 12 months? (Seven-point Likert scale with labeled extrema (0 = very few employees, 6 = all employees) and “cannot answer” option)</p> <p>Please estimate the rate of absenteeism in the last 12 months in %.</p> <p>How does your company's absenteeism rate compare to other companies in your industry over the past 12 months? (Seven-point Likert scale with labeled extrema (0 = very few employees, 6 = all employees) and “cannot answer” option)</p> <p>What was the financial turnover in the last 12 months (total estimated)?</p> <p>What is the size of your company's balance sheet total?</p> <p>Please indicate your position in the company.</p> <p>How many years have you been working for the company?</p> <p>What industry does the company you currently work for belong to?</p> | <p>Wie viele Vollzeit-Mitarbeitende (absolut) sind in Ihrem Unternehmen beschäftigt? Hierbei zählen Teilzeit-Mitarbeitende anteilig. Bitte geben Sie eine möglichst genaue Schätzung ab.</p> <p>Bitte schätzen Sie die Fluktuationsrate in Ihrem Unternehmen in den letzten 12 Monaten in %.</p> <p>Wie hoch war die Fluktuationsrate in Ihrem Unternehmen im Vergleich zu anderen Unternehmen Ihrer Branche in den letzten 12 Monaten?</p> <p>Bitte schätzen Sie die Abwesenheitsrate in den letzten 12 Monaten in %.</p> <p>Wie hoch die Abwesenheitsrate in Ihrem Unternehmen im Vergleich zu anderen Unternehmen Ihrer Branche in den letzten 12 Monaten?</p> <p>Wie hoch war der Umsatz in den letzten 12 Monaten (insgesamt geschätzt)?</p> <p>Wie groß ist die Bilanzsumme Ihres Unternehmens?</p> <p>Bitte teilen Sie Ihre Position im Unternehmen mit.</p> <p>Wie viele Jahre sind Sie bereits in dem Unternehmen tätig?</p> <p>Zu welcher Branche zählt das Unternehmen, in dem Sie aktuell tätig sind?</p> <p>Bitte geben Sie an, ob Sie eher ein Unternehmen sind, dass Dienstleistungen erbringt oder Produkte herstellt.</p> <p>Geben Sie das Gründungsjahr des Unternehmens an (bspw. 1995). Falls Sie es</p> |

| | |
|---|---|
| <p>Please indicate whether you are more of a company that provides services or manufactures products.</p> <p>Indicate the year the company was founded (e.g., 1995). If you do not know, please give an estimated year of foundation (e.g., 1980).</p> <p>What is the first letter of the street of your company headquarters?</p> <p>What is the sum of the first three letters of your company?</p> | <p>nicht wissen, nennen Sie bitte ein geschätztes Gründungsjahr (bspw. 1980).</p> <p>Wie lautet der erste Buchstabe der Straße Ihres Unternehmenssitzes?</p> <p>Wie lautet die Summe der ersten drei Buchstaben Ihres Unternehmens?</p> |
|---|---|



Appendix XV: SEM – Descriptive statistics for items

| | TSVL1 | TSVL2 | TSVL3 | TSVL4 | TSVL8 | TSVL9 | TSVL10 | TSVL11 | INF1 |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| N Valid | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 |
| N Missing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mean | 5.237 | 5.445 | 5.358 | 5.208 | 6.150 | 6.087 | 6.121 | 5.879 | 5.133 |
| Median | 5.000 | 6.000 | 6.000 | 5.000 | 7.000 | 7.000 | 7.000 | 7.000 | 6.000 |
| Std. Deviation | 1.469 | 1.579 | 1.547 | 1.491 | 1.467 | 1.624 | 1.330 | 1.756 | 1.811 |
| Skewness | -0.752 | -1.050 | -0.970 | -0.767 | -2.097 | -1.904 | -1.694 | -1.624 | -0.777 |
| Kurtosis | 0.099 | 0.433 | 0.444 | 0.105 | 3.959 | 2.640 | 2.591 | 1.565 | -0.419 |
| Minimum | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Maximum | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |

| | INF2 | INF3 | INF4 | INF5 | Trust1 | Trust2 | Trust3 | Trust4 | Trust5 |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| N Valid | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 |
| N Missing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mean | 5.040 | 5.295 | 4.913 | 4.705 | 5.913 | 5.630 | 5.428 | 6.092 | 5.827 |
| Median | 6.000 | 6.000 | 6.000 | 5.000 | 6.000 | 6.000 | 6.000 | 6.000 | 6.000 |
| Std. Deviation | 2.106 | 1.880 | 2.191 | 2.017 | 1.298 | 1.377 | 1.834 | 1.058 | 1.203 |
| Skewness | -0.685 | -0.833 | -0.576 | -0.368 | -1.629 | -1.389 | -1.080 | -1.528 | -1.385 |
| Kurtosis | -0.971 | -0.527 | -1.175 | -1.214 | 2.668 | 1.492 | -0.026 | 2.588 | 1.944 |
| Minimum | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| Maximum | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |

| | Trust6 | Trust7 | TFLCult1 | TFLCult2 | TFLCult3 | TFLCult4 | FLEP1 | FLEP2 | FLEP3 |
|----------------|--------|--------|----------|----------|----------|----------|--------|--------|--------|
| N Valid | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 |
| N Missing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mean | 5.803 | 4.717 | 5.896 | 5.543 | 5.543 | 5.462 | 5.769 | 5.520 | 4.728 |
| Median | 6.000 | 5.000 | 6.000 | 6.000 | 6.000 | 6.000 | 6.000 | 6.000 | 5.000 |
| Std. Deviation | 1.341 | 1.734 | 1.095 | 1.241 | 1.273 | 1.375 | 1.025 | 1.103 | 1.201 |
| Skewness | -1.332 | -0.503 | -1.190 | -0.959 | -1.192 | -1.178 | -1.127 | -0.907 | -0.357 |
| Kurtosis | 1.382 | -0.964 | 1.626 | 0.948 | 1.503 | 1.053 | 2.707 | 1.775 | -0.105 |
| Minimum | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| Maximum | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |

| | FLEP4 | FLEP5 | FLEP6 | FLEP7 | FLEP8 | FLEP9 | FLEP10 | OP1 | OP2 |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| N Valid | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 |
| N Missing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mean | 5.740 | 5.572 | 5.023 | 5.370 | 5.272 | 5.277 | 5.162 | 5.728 | 5.821 |
| Median | 6.000 | 6.000 | 5.000 | 5.000 | 5.000 | 5.000 | 5.000 | 6.000 | 6.000 |
| Std. Deviation | 1.155 | 1.202 | 1.280 | 1.074 | 1.074 | 1.168 | 0.969 | 0.977 | 0.913 |
| Skewness | -1.334 | -1.057 | -0.515 | -0.612 | -0.590 | -0.867 | -0.796 | -1.322 | -0.517 |
| Kurtosis | 2.191 | 1.267 | -0.072 | 0.998 | 0.668 | 1.188 | 2.058 | 3.573 | -0.238 |
| Minimum | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 |
| Maximum | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |

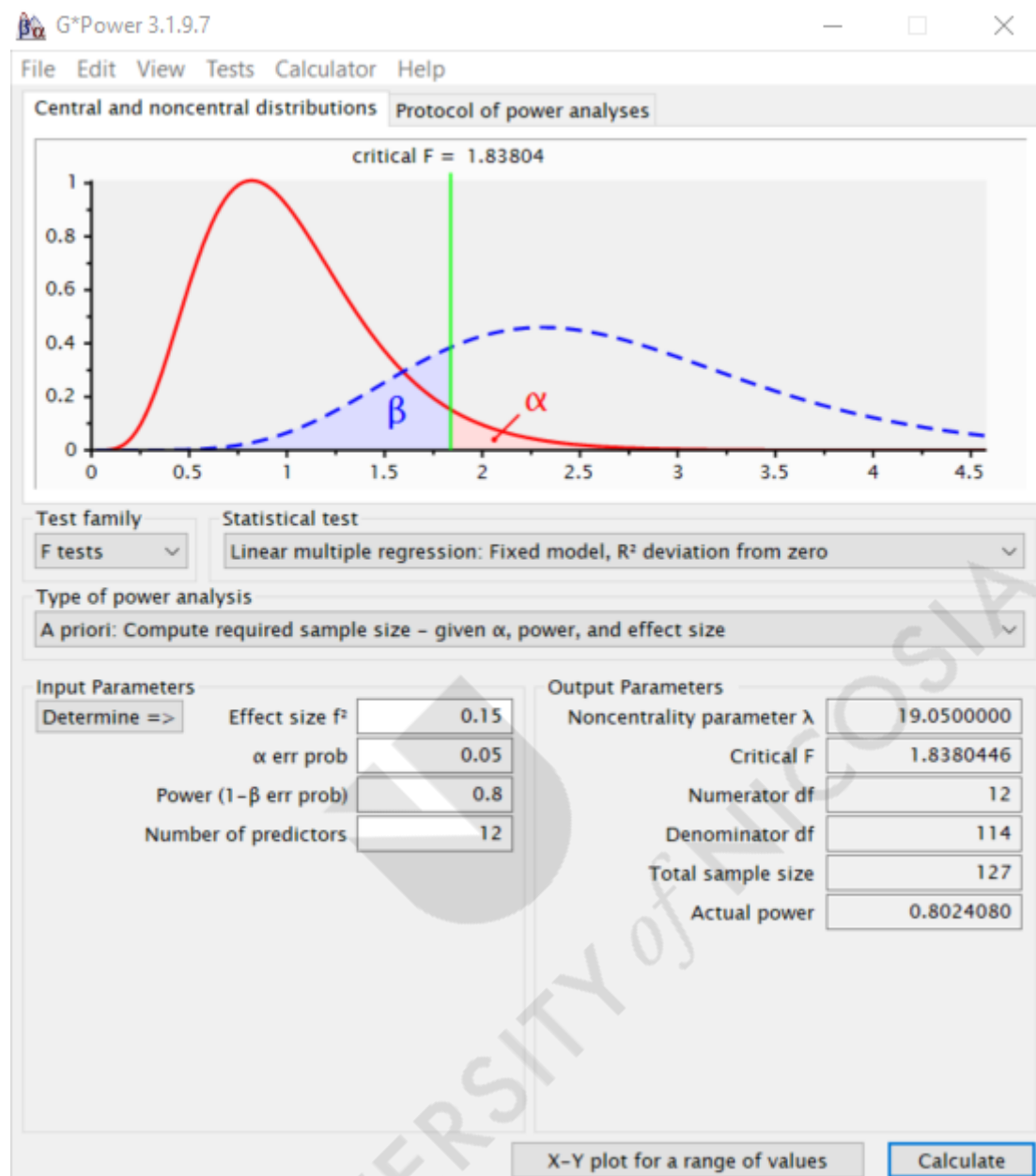
| | OP3 | OP4 | OP5 | OP6 | OP7 | OP8 | OP9 | OP10 | FP1 |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| N Valid | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 |
| N Missing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mean | 4.566 | 5.092 | 5.572 | 4.335 | 4.827 | 4.474 | 5.792 | 5.191 | 5.116 |
| Median | 5.000 | 5.000 | 6.000 | 4.000 | 5.000 | 5.000 | 6.000 | 5.000 | 5.000 |
| Std. Deviation | 1.117 | 0.990 | 0.983 | 1.468 | 1.318 | 1.421 | 0.904 | 1.313 | 1.397 |
| Skewness | -0.498 | -0.879 | -0.464 | -0.274 | -0.554 | -0.144 | -0.532 | -0.498 | -0.972 |
| Kurtosis | 0.054 | 1.531 | -0.264 | -0.455 | 0.331 | -0.401 | 0.047 | -0.114 | 0.860 |
| Minimum | 1 | 1 | 3 | 1 | 1 | 1 | 3 | 1 | 1 |
| Maximum | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |

| | FP2 | FP3 | FP4 | FP5 | ENF1 | ENF2 | ENF3 | FF1 | FF2 |
|----------------|--------|--------|--------|--------|-------|--------|-------|-------|--------|
| N Valid | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 |
| N Missing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mean | 5.023 | 4.896 | 4.740 | 5.301 | 1.954 | 2.942 | 1.971 | 2.370 | 5.711 |
| Median | 5.000 | 5.000 | 5.000 | 5.000 | 1.000 | 3.000 | 1.000 | 2.000 | 6.000 |
| Std. Deviation | 1.267 | 1.029 | 1.306 | 1.090 | 1.599 | 1.973 | 1.424 | 1.563 | 1.509 |
| Skewness | -0.739 | -0.631 | -0.536 | -0.595 | 1.579 | 0.665 | 1.799 | 1.057 | -1.203 |
| Kurtosis | 0.453 | 0.703 | 0.098 | 0.279 | 1.405 | -0.857 | 2.891 | 0.338 | 0.651 |
| Minimum | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| Maximum | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |

| | FF3 | FF4 | FF5 | PF1 | PF2 | PF3 | PF4 | PF5 | CF1 |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| N Valid | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 |
| N Missing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mean | 3.231 | 3.480 | 5.231 | 4.318 | 4.075 | 3.428 | 3.740 | 3.486 | 2.364 |
| Median | 3.000 | 3.000 | 6.000 | 5.000 | 4.000 | 3.000 | 4.000 | 3.000 | 1.000 |
| Std. Deviation | 1.903 | 1.845 | 1.579 | 2.034 | 1.929 | 1.874 | 2.079 | 2.374 | 1.852 |
| Skewness | 0.478 | 0.221 | -0.836 | -0.360 | -0.113 | 0.401 | 0.128 | 0.304 | 1.209 |
| Kurtosis | -0.993 | -1.060 | -0.029 | -1.118 | -1.195 | -1.033 | -1.414 | -1.517 | 0.269 |
| Minimum | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Maximum | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |

| | CF2 | CF3 | CF4 | CF5 | HRCP1 | HRCP2 | HRCP3 | HRCP4 | HRCP5 | HRCP6 |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| N Valid | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 | 173 |
| N Missing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mean | 3.329 | 3.491 | 4.139 | 3.705 | 4.358 | 4.000 | 5.341 | 4.416 | 5.335 | 4.855 |
| Median | 3.000 | 3.000 | 4.000 | 4.000 | 5.000 | 4.000 | 6.000 | 5.000 | 6.000 | 5.000 |
| Std. Deviation | 2.278 | 2.339 | 2.155 | 2.226 | 1.874 | 1.681 | 1.468 | 1.808 | 1.518 | 1.687 |
| Skewness | 0.420 | 0.261 | -0.157 | 0.115 | -0.280 | -0.104 | -1.009 | -0.341 | -0.977 | -0.571 |
| Kurtosis | -1.352 | -1.505 | -1.323 | -1.433 | -1.097 | -0.895 | 0.530 | -0.903 | 0.483 | -0.532 |
| Minimum | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Maximum | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |

Appendix XVI: A priori G*Power analysis



Extracted from G*Power analysis software version 3.1.9.7

Appendix XVII: Initial model analysis

Appendix XVII.I: Measurement model – Summary of initial measurement model assessment

| Construct | No. of indicators | Indicator loadings (min. to max.) | Cronbach's alpha | Composite reliability | AVE | Discriminant validity |
|-------------------------------------|-------------------|--------------------------------------|------------------|-----------------------|-------|-----------------------|
| Company age | 1 | 1.000 | 1.000 | 1.000 | 1.000 | Yes |
| Company size | 1 | 1.000 | 1.000 | 1.000 | 1.000 | Yes |
| Cost flexibility | 3 | .742 – .827 | .585 | .764 | .456 | Yes |
| Employee absenteeism | 1 | 1.000 | 1.000 | 1.000 | 1.000 | Yes |
| Employee turnover | 1 | 1.000 | 1.000 | 1.000 | 1.000 | Yes |
| External numerical flexibility | 3 | .590 – .773 | .447 | .722 | .466 | No |
| Financial performance | 5 | .748 – .863 | .878 | .911 | .672 | Yes |
| Firm-level employee performance | 7 | .675 – .823 | .858 | .887 | .442 | Yes |
| Functional flexibility | 4 | .599 – .844 | .734 | .816 | .479 | Yes |
| HR commitment practices | 6 | .646 – .804 | .834 | .876 | .541 | Yes |
| Industry type | 1 | 1.000 | 1.000 | 1.000 | 1.000 | Yes |
| Internal numerical flexibility | 5 | .676 – .876 | .850 | .893 | .626 | Yes |
| Operational performance | 6 | .659 – .764 | .849 | .880 | .425 | Yes |
| Procedural flexibility | 3 | .520 – .929 | .570 | .705 | .398 | Yes |
| Transformational leadership climate | 4 | .861 – .886 | .898 | .929 | .765 | Yes |
| Trust | 6 | .576 – .888 | .893 | .918 | .621 | Yes |

Appendix XVII.II: Measurement model – Discriminant validity assessment

| Construct | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|--|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----|
| 1 Company age | .381 | | | | | | | | | | | | | | | |
| 2 Company size | [.268 ; .478] | .221 | | | | | | | | | | | | | | |
| 3 Cost flexibility | [.082 ; .359] | .135 | | | | | | | | | | | | | | |
| 4 Employee absenteeism | [.069 ; .313] | .272 | .164 | | | | | | | | | | | | | |
| 5 Employee turnover | [.003 ; .154] | .344 | .082 | .347 | | | | | | | | | | | | |
| 6 External numerical flexibility | [.007 ; .317] | .269 | .349 | .402 | .664 | | | | | | | | | | | |
| 7 Financial performance | [.053 ; .132] | .046 | .136 | .021 | .139 | .118 | | | | | | | | | | |
| 8 Firm-level employee performance | [.220 ; .444] | .255 | .264 | .257 | .245 | .483 | .190 | | | | | | | | | |
| 9 Functional flexibility | [.251 ; .511] | .248 | .380 | .203 | .263 | .632 | .165 | .614 | | | | | | | | |
| 10 HR commitment practices | [.213 ; .411] | .289 | .384 | .178 | .278 | .614 | .313 | .614 | .887 | | | | | | | |
| 11 Industry type | [.171 ; .363] | .234 | .147 | .085 | .100 | .408 | .075 | .283 | .267 | .299 | | | | | | |
| 12 Internal numerical flexibility | [.236 ; .465] | .241 | .434 | .174 | .187 | .318 | .078 | .364 | .526 | .527 | .275 | | | | | |
| 13 Operational performance | [.094 ; .256] | .214 | .181 | .164 | .369 | .431 | .435 | .734 | .454 | .504 | .125 | .136 | | | | |
| 14 Procedural flexibility | [.077 ; .360] | .146 | .240 | .203 | .079 | .403 | .151 | .201 | .186 | .164 | .114 | .155 | .214 | | | |
| 15 Transformational leadership climate | [.256 ; .458] | .416 | .232 | .275 | .380 | .487 | .142 | .665 | .780 | .740 | .265 | .486 | .518 | .192 | | |
| 16 Trust | [.097 ; .295] | .315 | .204 | .266 | .489 | .673 | .247 | .520 | .648 | .740 | .191 | .415 | .511 | .174 | .792 | |

(HTMT values in bold, bias corrected confidence intervals in square brackets)

Appendix XVII.III: Structural model – Analysis of VIF values regarding collinearity issues

| Latent variables | Company age | Company size | Cost flexibility | Employee absenteeism | Employee turnover | Financial performance | Firm-level employee performance | Functional flexibility | HR commitment practices | Industry type | Internal numerical flexibility | Operational performance | Procedural flexibility | Transformational leadership climate | Trust |
|-------------------------------------|-------------|--------------|------------------|----------------------|-------------------|-----------------------|---------------------------------|------------------------|-------------------------|---------------|--------------------------------|-------------------------|------------------------|-------------------------------------|-------|
| Company age | | | | | | 1.269 | | | | | | | | | |
| Company size | | | | | | 1.372 | | | | | | | | | |
| Cost flexibility | | | | | | | 1.198 | | | | 1.104 | | | | |
| Employee absenteeism | | | | | | 1.192 | | | | | | 1.172 | | | |
| Employee turnover | | | | | | 1.359 | | | | | | 1.170 | | | |
| Financial performance | | | | | | | | | | | | | | | |
| Firm-level employee performance | | | | | | | | | | | | 1.092 | | | |
| Functional flexibility | | | | | | | 2.296 | | | | 2.269 | | | | |
| HR commitment practices | | | | | | | 2.837 | | | | 2.772 | | | | |
| Industry type | | | | | | 1.104 | | | | | | | | | |
| Internal numerical flexibility | | | | | | | 1.455 | | | | | | | | |
| Operational performance | | | | | | 1.155 | | | | | | | | | |
| Procedural flexibility | | | | | | | 1.032 | | | | | | | | |
| Transformational leadership climate | | | | | | | 2.666 | | | | 2.600 | | | | 1.000 |
| Trust | | | | | | | 2.429 | | | | 2.427 | | | | |

Appendix XVII.IV: Structural model – Analysis of significance and relevance of relationships

| Paths | Path co- efficient β | f^2 | p va- lue | Bias correct confidence in- terval | | Sig. |
|--|----------------------------------|-------|----------------|--|-------|------|
| | | | | 5.0% | 95.0% | |
| Company age → Financial performance | -.047 | .002 | .529 | -.173 | .073 | × |
| Company size → Financial performance | .127 | .014 | .125 | -.012 | .258 | × |
| Cost flexibility → Firm-level employee performance | .012 | .000 | .859 | -.103 | .125 | × |
| Cost flexibility → Internal numerical flexibility | .239 | .075 | .002 | .102 | .357 | ✓ |
| Employee absenteeism → Financial performance | .071 | .005 | .358 | -.050 | .207 | × |
| Employee absenteeism → Operational performance | .063 | .006 | .306 | -.038 | .163 | × |
| Employee turnover → Financial performance | -.066 | .004 | .425 | -.213 | .063 | × |
| Employee turnover → Operational performance | -.211 | .068 | .001 | -.319 | -.101 | ✓ |
| Firm-level employee performance → Operational performance | .598 | .584 | .000 | .484 | .702 | ✓ |
| Functional flexibility → Firm-level employee performance | .124 | .011 | .209 | -.043 | .280 | × |
| Functional flexibility → Internal numerical flexibility | .128 | .010 | .233 | -.053 | .295 | × |
| HR commitment practices → Firm-level employee performance | .188 | .020 | .062 | .017 | .349 | ✓ |
| HR commitment practices → Internal numerical flexibility | .210 | .023 | .044 | .039 | .382 | ✓ |
| Industry type → Financial performance | -.050 | .003 | .484 | -.163 | .069 | × |
| Internal numerical flexibility → Firm-level employee performance | .005 | .000 | .941 | -.101 | .113 | × |
| Operational performance → Financial performance | .378 | .148 | .000 | .250 | .481 | ✓ |
| Procedural flexibility → Firm-level employee performance | .035 | .002 | .667 | -.192 | .115 | × |

| | | | | | | |
|---|-------|-------|------|-------|------|---|
| Transformational leadership climate → Firm-level employee performance | .393 | .095 | .000 | .238 | .549 | ✓ |
| Transformational leadership climate → Internal numerical flexibility | .176 | .017 | .097 | .002 | .353 | ✓ |
| Transformational leadership climate → Trust | .721 | 1.082 | .000 | .634 | .780 | ✓ |
| Trust → Firm-level employee performance | -.022 | .000 | .825 | -.187 | .136 | × |
| Trust → Internal numerical flexibility | -.018 | .000 | .870 | -.198 | .169 | × |



Appendix XVII.V: Moderation analysis – TRVL (HOC) moderator on transformational leadership climate and firm-level employee performance

| Path | Path coefficient | f^2 | p value |
|--|------------------|-------|-----------|
| Stage 1 | | | |
| Transformational leadership climate → firm-level employee performance | .357 | .074 | .001 |
| TRVL (HOC) → firm-level employee performance | .121 | .011 | .169 |
| Stage 2 | | | |
| Moderation of TRVL (HOC) on relationship between transformational leadership climate → firm-level employee performance | .053 | .005 | .411 |

Appendix XVII.VI: Moderation analysis – TRVL (HOC) moderator on transformational leadership climate and trust

| Path | Path coef- ficient | f^2 | p value |
|--|-------------------------------|-------------------------|-----------------------------|
| Stage 1 | | | |
| Transformational leadership climate → trust | .734 | .767 | .000 |
| TRVL (HOC) → trust | -.024 | .001 | .760 |
| Stage 2 | | | |
| Moderation of TRVL (HOC) on relationship between transformational leadership climate → trust | .073 | .012 | .194 |



Appendix XVIII: Final model analysis

Appendix XVIII.I: Measurement model – Discriminant validity assessment

| Construct | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----|
| 1 Company age | | | | | | | | | | | | | | | | |
| 2 Company size | .381 | | | | | | | | | | | | | | | |
| | [.268 ; .481] | | | | | | | | | | | | | | | |
| 3 Cost flexibility | .221 | .135 | | | | | | | | | | | | | | |
| | [.094 ; .359] | [.039 ; .178] | | | | | | | | | | | | | | |
| 4 Employee absenteeism | .191 | .272 | .164 | | | | | | | | | | | | | |
| | [.067 ; .308] | [.162 ; .374] | [.053 ; .294] | | | | | | | | | | | | | |
| 5 Employee turnover | .058 | .344 | .082 | .347 | | | | | | | | | | | | |
| | [.004 ; .159] | [.226 ; .455] | [.012 ; .130] | [.207 ; .465] | | | | | | | | | | | | |
| 6 Financial performance | .100 | .046 | .136 | .021 | .139 | | | | | | | | | | | |
| | [.051 ; .129] | [.015 ; .055] | [.075 ; .161] | [.010 ; .013] | [.052 ; .272] | | | | | | | | | | | |
| 7 Firm-level employee performance | .340 | .255 | .264 | .257 | .245 | .190 | | | | | | | | | | |
| | [.220 ; .447] | [.150 ; .362] | [.155 ; .365] | [.101 ; .438] | [.140 ; .365] | [.111 ; .259] | | | | | | | | | | |
| 8 Functional flexibility | .389 | .248 | .380 | .203 | .263 | .165 | .614 | | | | | | | | | |
| | [.246 ; .513] | [.143 ; .331] | [.237 ; .511] | [.081 ; .356] | [.145 ; .387] | [.090 ; .238] | [.483 ; .722] | | | | | | | | | |
| 9 HR commitment practices | .313 | .289 | .384 | .178 | .278 | .313 | .614 | .887 | | | | | | | | |
| | [.213 ; .410] | [.193 ; .379] | [.250 ; .511] | [.083 ; .306] | [.168 ; .401] | [.192 ; .447] | [.499 ; .707] | [.799 ; .964] | | | | | | | | |
| 10 Industry type | .268 | .234 | .147 | .085 | .100 | .075 | .283 | .267 | .299 | | | | | | | |
| | [.168 ; .362] | [.127 ; .330] | [.053 ; .269] | [.007 ; .213] | [.011 ; .238] | [.029 ; .123] | [.160 ; .411] | [.144 ; .405] | [.142 ; .448] | | | | | | | |
| 11 Internal numerical flexibility | .349 | .241 | .434 | .174 | .187 | .078 | .364 | .526 | .527 | .275 | | | | | | |
| | [.228 ; .462] | [.123 ; .365] | [.298 ; .564] | [.078 ; .281] | [.091 ; .311] | [.049 ; .074] | [.256 ; .463] | [.389 ; .652] | [.405 ; .632] | [.160 ; .391] | | | | | | |
| 12 Operational performance | .179 | .214 | .181 | .164 | .369 | .435 | .734 | .454 | .504 | .125 | .136 | | | | | |
| | [.095 ; .257] | [.116 ; .330] | [.097 ; .193] | [.074 ; .285] | [.232 ; .497] | [.319 ; .558] | [.615 ; .833] | [.310 ; .587] | [.385 ; .613] | [.054 ; .215] | [.084 ; .151] | | | | | |
| 13 Procedural flexibility | .207 | .146 | .240 | .203 | .079 | .151 | .201 | .186 | .164 | .114 | .155 | .214 | | | | |
| | [.074 ; .358] | [.038 ; .217] | [.105 ; .312] | [.077 ; .340] | [.013 ; .130] | [.076 ; .188] | [.119 ; .223] | [.070 ; .213] | [.071 ; .193] | [.023 ; .167] | [.065 ; .197] | [.115 ; .257] | | | | |
| 14 TRVL (HOC) | .363 | .192 | .286 | .104 | .231 | .076 | .492 | .663 | .566 | .256 | .810 | .253 | .103 | | | |
| | [.247 ; .466] | [.075 ; .308] | [.133 ; .433] | [.025 ; .207] | [.096 ; .379] | [.028 ; .092] | [.379 ; .597] | [.526 ; .778] | [.444 ; .668] | [.112 ; .404] | [.716 ; .886] | [.152 ; .335] | [.015 ; .117] | | | |
| 15 Transformational leadership climate | .367 | .416 | .232 | .275 | .380 | .142 | .665 | .780 | .740 | .265 | .486 | .518 | .192 | .617 | | |
| | [.258 ; .458] | [.310 ; .508] | [.128 ; .331] | [.126 ; .417] | [.255 ; .498] | [.071 ; .257] | [.542 ; .748] | [.674 ; .870] | [.648 ; .814] | [.112 ; .424] | [.378 ; .581] | [.394 ; .628] | [.088 ; .316] | [.515 ; .698] | | |
| 16 Trust | .199 | .315 | .204 | .266 | .489 | .247 | .520 | .648 | .740 | .191 | .415 | .511 | .174 | .399 | .792 | |
| | [.096 ; .301] | [.188 ; .427] | [.107 ; .272] | [.136 ; .397] | [.374 ; .595] | [.136 ; .377] | [.398 ; .633] | [.512 ; .752] | [.639 ; .819] | [.087 ; .340] | [.293 ; .522] | [.367 ; .640] | [.094 ; .233] | [.274 ; .516] | [.701 ; .859] | |

(HTMT values in bold, bias corrected confidence intervals in square brackets)

Appendix XVIII.II: Structural model – Analysis of VIF values regarding collinearity issues

| Latent variables | Company age | Company size | Cost flexibility | Employee absenteeism | Employee turnover | Financial performance | Firm-level employee performance | Functional flexibility | HR commitment practices | Industry type | Internal numerical flexibility | Operational performance | Procedural flexibility | TRVL (HOC) | Transformational leadership climate | Trust |
|---------------------------------|-------------|--------------|------------------|----------------------|-------------------|-----------------------|---------------------------------|------------------------|-------------------------|---------------|--------------------------------|-------------------------|------------------------|------------|-------------------------------------|-------|
| Company age | | | | | | 1.269 | | | | | | | | | | |
| Company size | | | | | | 1.372 | | | | | | | | | | |
| Cost flexibility | | | | | | | 1.194 | | | | 1.113 | | | | | |
| Employee absenteeism | | | | | | 1.192 | | | | | | 1.172 | | | | |
| Employee turnover | | | | | | 1.359 | | | | | | 1.171 | | | | |
| Financial performance | | | | | | | | | | | | | | | | |
| Firm-level employee performance | | | | | | | | | | | | 1.092 | | | | |
| Functional flexibility | | | | | | | 2.296 | | | | 2.358 | | | | | |
| HR commitment practices | | | | | | | 2.836 | | | | 2.832 | | | | | |

| | | | | | |
|-------------------------------------|-------|-------|-------|-------|--|
| Industry type | 1.104 | | | | |
| Internal numerical flexibility | 1.445 | | | | |
| Operational performance | 1.155 | | | | |
| Procedural flexibility | 1.032 | | | | |
| TRVL (HOC) | | 1.592 | | | |
| Transformational leadership climate | 2.665 | 2.831 | 1.000 | 1.000 | |
| Trust | 2.429 | 2.493 | | | |

Appendix XVIII.III: Structural model – Analysis of significance and relevance of relationships

| Paths | Path coef- ficient β | f^2 | p value | Bias correct confidence in- terval | | Sig. |
|--|-------------------------------|-------|-----------|--|-------|------|
| | | | | 5.0% | 95.0% | |
| Company age → Financial performance | -.047 | .002 | .533 | -.172 | .077 | × |
| Company size → Financial performance | .127 | .014 | .130 | -.005 | .269 | × |
| Cost flexibility → Firm-level employee performance | .013 | .000 | .852 | -.103 | .128 | × |
| Cost flexibility → Internal numerical flexibility | .189 | .066 | .001 | .098 | .290 | ✓ |
| Employee absenteeism → Financial performance | .071 | .005 | .360 | -.060 | .193 | × |
| Employee absenteeism → Operational performance | .063 | .006 | .304 | -.030 | .171 | × |
| Employee turnover → Financial performance | -.066 | .004 | .420 | -.202 | .067 | × |
| Employee turnover → Operational performance | -.211 | .068 | .001 | -.319 | -.102 | ✓ |
| Firm-level employee performance → Operational performance | .598 | .584 | .000 | .492 | .701 | ✓ |
| Functional flexibility → Firm-level employee performance | .125 | .011 | .197 | -.032 | .292 | × |
| Functional flexibility → Internal numerical flexibility | -.009 | .000 | .920 | -.142 | .145 | × |
| HR commitment practices → Firm-level employee performance | .189 | .021 | .058 | .027 | .355 | ✓ |
| HR commitment practices → Internal numerical flexibility | .100 | .007 | .287 | -.056 | .248 | × |
| Industry type → Financial performance | -.050 | .003 | .486 | -.168 | .065 | × |
| Internal numerical flexibility → Firm-level employee performance | .001 | .000 | .987 | -.104 | .109 | × |
| Operational performance → Financial performance | .378 | .148 | .000 | .272 | .501 | ✓ |
| Procedural flexibility → Firm-level employee performance | .035 | .002 | .669 | -.126 | .156 | × |
| TRVL (HOC) → Internal numerical flexibility | .571 | .420 | .000 | .449 | .682 | ✓ |

| | | | | | | |
|---|-------|-------|------|-------|------|---|
| Transformational leadership climate → Firm-level employee performance | .393 | .095 | .000 | .235 | .541 | ✓ |
| Transformational leadership climate → Internal numerical flexibility | -.043 | .001 | .637 | -.194 | .103 | × |
| Transformational leadership climate → TRVL (HOC) | .532 | .395 | .000 | .451 | .611 | ✓ |
| Transformational leadership climate → Trust | .721 | 1.081 | .000 | .643 | .790 | ✓ |
| Trust → Firm-level employee performance | -.022 | .00 | .824 | -.193 | .126 | × |
| Trust → Internal numerical flexibility | .099 | .008 | .239 | -.036 | .243 | × |



Appendix XVIII.IV: Structural model – Predictive power analysis

| Indicator | PLS | | LM | | RMSE in PLS-SEM < LM |
|-----------|-------|-------------------------|-------|------------------------------|-------------------------|
| | RMSE | Q ² _predict | RMSE | Q ² _pre- dict | |
| FLEP10 | .933 | .081 | 1.043 | -.148 | ✓ |
| FLEP2 | 1.003 | .178 | 1.095 | .020 | ✓ |
| FLEP7 | .983 | .167 | 1.044 | .060 | ✓ |
| FLEP8 | 1.017 | .111 | 1.087 | -.017 | ✓ |
| FLEP4 | .942 | .337 | .919 | .369 | ✗ |
| FLEP6 | 1.211 | .107 | 1.302 | -.032 | ✓ |
| FLEP9 | 1.081 | .148 | 1.183 | -.021 | ✓ |
| INF2 | 1.879 | .208 | 1.920 | .173 | ✓ |
| INF1 | 1.667 | .156 | 1.712 | .110 | ✓ |
| INF3 | 1.775 | .114 | 1.922 | -.039 | ✓ |
| INF5 | 1.802 | .205 | 1.939 | .080 | ✓ |
| INF4 | 2.122 | .065 | 2.290 | -.088 | ✓ |